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(71) Applicant *(for all designated States except US)*: **AMERICAN EXPRESS TRAVEL RELATED SERVICES COMPANY, INC.** [US/US]; American Express Tower, World Financial Center, New York City, NY 10285-4900 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **BEENAU, Blayn, W.** [US/US]; 15306 North 89th Avenue, Peoria, AZ 85381 (US). **BLIMAN, Michal** [US/US]; 4 Dogwood Circle, Matawan, NJ 07747 (US). **BONALLE, David, S.** [US/US]; 77 Rose Hill Avenue, New Rochelle, NY 10804 (US). **MONTGOMERY, Joshua, L.** [US/US]; 1656 North 980 West, Orem, UT 84057 (US). **SAUNDERS, Peter, D.** [US/US]; 3710 East Palisade Drive, Salt Lake City, UT 84109 (US). **WILLIAMSON, John, R.** [US/US]; 302 Pavonia Avenue, Jersey City, NJ 07302 (US).

(74) Agent: **SOBELMAN, Howard, I.**; Snell & Wilmer L.L.P., One Arizona Center, 400 East Van Buren, Phoenix, AZ 85004-2202 (US).

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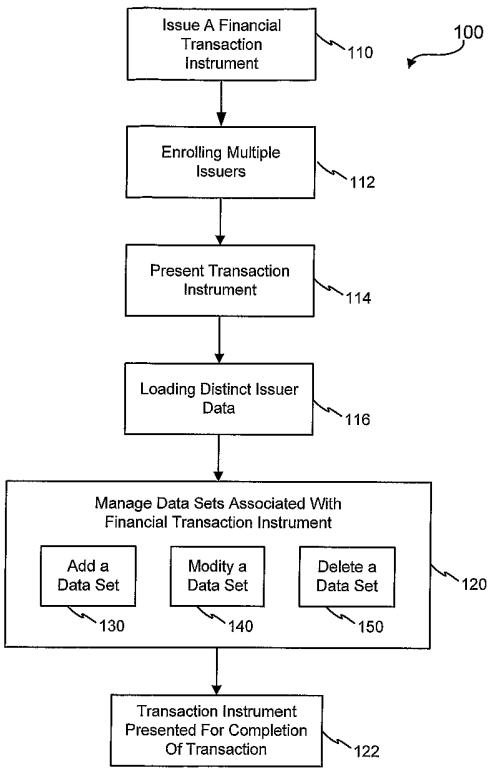
(54) Title: SYSTEMS AND METHODS FOR MANAGING MULTIPLE ACCOUNTS ON A RF TRANSACTION INSTRUMENT



(57) Abstract: Systems and methods are configured to manage data sets associated with a transaction instrument. For example, a method is provided for facilitating the management of distinct data sets on a transaction instrument that are provided by distinct data set owners, wherein the distinct data sets may include differing formats. The method includes the steps of: adding, by a read/write, a first data set to the financial transaction instrument, wherein the first data set is owned by a first owner; adding, by the read/write device, a second data set to the financial transaction instrument, wherein the second data set is owned by a second owner; and storing the first data set and the second data set on the financial transaction instrument in accordance with an owner defined format. The first and second data sets may each be stored as a Block of Binary. Furthermore, the first data set may be updated and/or deleted from the financial transaction instrument by the data owner or the transaction instrument user, in real-time or substantially real-time or at a later date. In another example, a financial transaction instrument comprises a data set management system for facilitating the management of more than one data set, the transaction instrument comprising at least one data storage area configured to store a first data set of a first format and a second data set of a second format different than the first format. The first and second data sets are associated with first and second owners, respectively, and are configured to be stored independent of each other. In yet another example, the data sets may be stored on a remote database under the identical arrangement as is stored on the transaction instrument.

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SYSTEMS AND METHODS FOR MANAGING MULTIPLE ACCOUNTS ON A RF TRANSACTION INSTRUMENT

Field of Invention

The present invention generally relates to payment systems, and more particularly, to systems and methods for facilitating the management of multiple data sets on various card and "non-card" transaction enabling instruments.

Background of the Invention

Some financial transaction instruments, such as credit cards and loyalty program cards, are capable of accessing information related to multiple accounts. For example, a credit card may be able to access membership data associated with both a credit card account and a wholesale purchase club account. These financial transaction instruments may generally include one or more applications for selecting and then securely utilizing a sub-set of specified account information. However, the systems associated with these cards typically delegate the loading of these applications and management of the related data sets to third parties on behalf of both the issuer of the instrument and "application tenants" residing on the issuer's financial transaction instruments. Managing data associated with a credit card via the issuer/third party may involve time consuming steps such as requesting permission to manage data, conforming to data standard formats, and implementing changes. Thus, traditional solutions for managing multiple application tenants are disadvantageous in that the traditional solutions leave a disproportional burden on the issuer and/or the delegated third party in terms of managing accounts on a financial transaction instrument.

Another disadvantage is that, in general, the financial transaction instruments, which are capable of accessing information related to multiple accounts, are typically designed to access only those multiple accounts managed by the same issuer. For example, the same issuer provides both the credit card and the wholesale purchase club account to the user. As such, the issuer providing both accounts generally establishes its own application tenant storage format and management protocol related to the accounts. The established format and protocol is ordinarily different from any format or protocol used by other unrelated issuers, which provides the issuer increased control over access to the account data. Because of the differing unique protocols/formats amongst issuers, multiple issuers typically

provide a transaction instrument corresponding to an account offered by the issuer, where the data for accessing the account is stored in that issuer's protocol/format. Thus, a user wishing to access multiple accounts managed by different issuers, must ordinarily carry at least one transaction instrument per issuer. Carrying multiple transaction instruments can be inconvenient in that the instruments may be more easily misplaced, lost or stolen, preventing the user from accessing the account.

Another disadvantage of the above conventional methods of managing multiple accounts, which is related to the different issuer formats/protocols, is that, since conventional financial transaction instruments typically only store application tenant information related to one issuer, the information may not be recognized by a second issuer distinct from the first. That is, the user of the financial transaction instrument typically is only able to use the financial transaction instrument at locations identified by the issuer of the transaction card. The financial transaction instrument may not be used at any other locations, since the locations not identified by the user will not recognize the application tenant information which is typically stored on the instrument in an issuer determined format. As such, in order to access multiple accounts managed by different issuers using different formats/protocols, the user must typically carry multiple cards, as noted above.

In addition to the above, the conventional multiple account management systems have another disadvantage in that data contained on the financial transaction instruments may not be easily updated. That is, traditional financial transaction instruments are only "readable" instruments, and not "writeable" instruments, where the data on the instrument may be read from the instrument but not written to the instrument. More particularly, once the financial instrument is issued to the user, the data often may not be modified. Instead, where information contained on the instrument is to be modified, a new physical consumer device (*e.g.*, transaction instrument) often needs to be issued. That is, the information stored on the financial transaction instruments is typically not permitted to be changed without issuer involvement. The issuer may be involved, for example, by verifying compatibility of a proposed new or updated information, checking conformance of the data to the issuer's standard formatting and size guidelines, and implementing the changes. Thus, additional burdens are placed on the issuer where it is necessary to add unique data sets to a financial transaction instrument, or to update the data stored thereon.

As such, the ability to store data on a single financial transaction instrument thereby permitting a user of the single instrument to complete transactions using multiple transaction

accounts issued by different distinct issuers, does not exist. A need exists for a single financial transaction instrument which stores multiple independent data sets provided by multiple distinct issuers irrespective of the format/protocol of the various issuers. A need further exists for a single financial transaction instrument which may be used to efficiently manage the data sets and applications stored on the instrument, irrespective of the protocol used by an issuer to process the data. Even more particularly, a need exists for a system for managing multiple transaction accounts of differing formats on a single financial transaction instrument which is issued to a user, and which permits the user to access different accounts provided by multiple distinct financial account issuers.

Summary of the Invention

In one exemplary embodiment of the present invention, a system and method is provided for facilitating the management of distinct data sets of different formats on a RF operable transaction instrument. The system includes a RF financial transaction instrument for use in managing multiple distinct data sets provided by distinct issuers. The method includes the steps of: receiving, from a read/write device, at least a first data of a first format at the financial transaction instrument, wherein the first data set is owned by a first owner; receiving, from the read/write device, at least a second data set of a second format at the financial transaction instrument, wherein the second data set is owned by a second owner, and wherein the first format is different from the second format; storing the first data set and the second data set on the financial transaction instrument, in distinct fashion and in accordance with the first and second format respectively, where the first data set and the second data set are unique one from the other; and modifying (*e.g.*, adding, deleting, overwriting, altering) at least the first data set, and/or adding a third data set, in accordance with instructions provided by the data set owner or user.

In another example, a financial transaction instrument comprises a data set management system for facilitating the management of more than one data set stored on the transaction instrument, the RF financial transaction instrument comprising at least one data storage area configured to store a first data set of a first format and a second data set of a second format different from the first format. The first data set is associated with a first data set owner (*e.g.*, first issuer) and the first data set is configured to be stored on the financial transaction instrument independent of a second data set owner (*e.g.*, second issuer); and, the second data set is associated with the second owner and the second data set is configured to

be stored on the financial transaction instrument independent of the first data set owner, wherein the first data set and the second data set are stored in accordance with the first and second format, respectively.

In yet another exemplary embodiment of the present invention, a data management system comprises: a RF financial transaction instrument associated with a first data set of a first format and a second data set of a second format, wherein the financial transaction instrument is configured to facilitate management of the first data set without involvement of the first data set owner. The data management system may further comprise a read/write device configured to communicate with the financial transaction instrument for providing the first and second data sets to the instrument and for modifying the data sets thereon in accordance with a condition header annotated to the data sets. The read/write device may be stand alone, or the device may be connected to a transaction processing network. The read/write device may be used to load the issuer-owned data onto the transaction instrument, and thereafter delete, augment and/or manage the information stored thereon, or to add additional distinct data sets.

As noted, exemplary embodiments of the financial transaction instrument of the present invention may include storing a first and second data set of differing formats on a transaction instrument database. Alternate exemplary embodiments of the present invention may also include a "mirror image" of the first and second data set stored on a remote database removed from the transaction instrument issuer and the transaction instrument itself. The remote database may be placed in communication with the transaction instrument issuer system, and the financial transaction instrument via, for example, electronic communication with a network. As such, in one exemplary aspect, the present invention permits changes which are made on the remote database (or transaction instrument) to be mimicked or synchronized on the instrument (or remote database).

In still another exemplary embodiment, the invention secures authorization from an issuer prior to loading the issuer-owned data onto the RF transaction instrument. Once authorization is given, the issuer may be "enrolled" in a transaction instrument multiple account management system, the associated issuer-owned data may then be loaded on the transaction instrument. The issuer-owned data may be loaded in a format recognizable by a merchant system or by a system maintained by issuer. Thus, when the transaction instrument is presented to complete a transaction, the data may be transferred to the issuer in an issuer recognized format, eliminating the need to carry multiple transaction instruments

for each issuer. That is, the issuer receives the data in an issuer recognized format and may process the accompanying transaction under issuer's already established business as usual protocols. In this way, the issuer is permitted to manage its issuer provided program at the issuer location, irrespective of the management of other programs provided by other distinct issuers enrolled in the multiple account management system.

Brief Description of the Drawings

A more complete understanding of the present invention may be derived by referring to the detailed description and claims when considered in connection with the Figures, wherein like reference numbers refer to similar elements throughout the Figures, and:

FIG. 1 illustrates a general overview of an exemplary data set management method in accordance with an exemplary embodiment of the present invention;

FIG. 2 illustrates a block diagram overview of an exemplary data set management system in accordance with an exemplary embodiment of the present invention;

FIG. 3 illustrates a more detailed exemplary data set management method in accordance with an exemplary embodiment of the present invention;

FIG. 4 illustrates an exemplary data set management method for adding data sets in accordance with an exemplary embodiment of the present invention;

FIG. 5 illustrates an exemplary data set management method for deleting data sets in accordance with an exemplary embodiment of the present invention;

FIG. 6 illustrates an exemplary method for user-self-management of data sets in accordance with an exemplary embodiment of the present invention;

FIG. 7 illustrates an exemplary method for issuer management of data sets in accordance with the present invention; and

FIG. 8 illustrates an exemplary data set selection method for use in completing a transaction.

Detailed Description of Exemplary Embodiments

While the exemplary embodiments herein are described in sufficient detail to enable those skilled in the art to practice the invention, it should be understood that other embodiments may be realized and that logical and mechanical changes may be made without departing from the spirit and scope of the invention. Thus, the following detailed description is presented for purposes of illustration only and not of limitation.

The present invention provides a system and method for a RF operable transaction instrument configured to manage multiple data sets (*e.g.*, "application tenants") of differing formats associated with a plurality of distinct transaction account issuers. In this context, an "application tenant" may include all or any portion of any data sets which are substantially correlated to an account issuer, which the issuer may additionally use to substantially identify an instrument user or related account. For example, where the account issuer provides application tenant information, the application tenant may include, *inter alia*, a membership identifier associated with a user enrolled in an issuer provided transaction account program, and all related subsets of data stored on the transaction instrument. Where multiple application tenants are referred to herein, each tenant may constitute its own distinct data set, independent of any other application tenant data sets. For example, each application tenant may include a unique membership identifier and all associated subsets of data. Alternatively, an application tenant may include a membership identifier and an application for processing all data owned by an issuer. Thus, the data set or subset may include the processing application. Moreover, differing formats, as discussed herein, include differences in all or any portion of the formats. As such, "application tenant" and "distinct data set," and data set "owner" and account "issuer" may be used interchangeably herein.

In addition, it should be noted that although the present invention is described with respect to a financial transaction instrument, the invention is not so limited. The invention is suitable for any instrument capable of storing distinct data sets which may be provided by multiple distinct account issuers where the distinct data sets may be formatted one different from another. The account may be, for example, a calling card, a loyalty, debit, credit, incentive, direct debit, savings, financial, membership account or the like. While the information provided by the account issuers may be described as being "owned" by the issuers, the issuers or their designees may simply be a manager of the account.

The present invention may be described herein in terms of functional block components, optional selections and/or various processing steps. It should be appreciated that such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit components (*e.g.*, memory elements, processing elements, logic elements, look-up tables, and/or the like), which may carry out a variety of functions under the control of one or more microprocessors or other control

devices. Similarly, the software elements of the present invention may be implemented with any programming or scripting language such as C, C++, Java, COBOL, assembler, PERL, Visual Basic, SQL Stored Procedures, extensible markup language (XML), with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Further, it should be noted that the present invention may employ any number of conventional techniques for data transmission, signaling, data processing, network control, and/or the like. For a basic introduction of cryptography and network security, the following may be helpful references: (1) "Applied Cryptography: Protocols, Algorithms, And Source Code In C," by Bruce Schneier, published by John Wiley & Sons (second edition 1996); (2) "Java Cryptography" by Jonathan Knudson, published by O'Reilly & Associates (1998); and (3) "Cryptography and Network Security: Principles and Practice" by Mayiam Stalling, published by Prentice Hall; all of which are hereby incorporated by reference.

As used herein, the terms "user," "end user," consumer," "customer" or "participant" may be used interchangeably with each other, and each shall mean any person, entity, machine, hardware, software and/or business. Furthermore, the terms "business" or "merchant" may be used interchangeably with each other and shall mean any person, entity, machine, hardware, software or business. Further still, the merchant may be any person, entity, software and/or hardware that is a provider, broker and/or any other entity in the distribution chain of goods or services. For example, the merchant may be a ticket/event agency (*e.g.*, Ticketmaster, Telecharge, Clear Channel, brokers, agents).

The systems and/or components of the systems discussed herein may also include one or more host servers or other computing systems including a processor configured to process digital data, a memory coupled to the processor for storing digital data, an input digitizer coupled to the processor for inputting digital data, an application program stored in the memory and accessible by the processor for directing processing of digital data by the processor, a display coupled to the processor and memory for displaying information derived from digital data processed by the processor and a plurality of databases, the databases including client data, merchant data, financial institution data and/or like data that could be used in association with the present invention. As those skilled in the art may appreciate, the user interface for each system described herein may typically include an operating system (*e.g.*, Windows NT, 95/98/2000, Linux, Solaris, etc.) as well as various conventional support software and drivers typically associated with computers. The user

computer and other systems described herein can be in a home or business environment with access to a network. In an exemplary embodiment, access is through the Internet through a commercially-available web-browser software package.

Communication between various elements of the present invention is accomplished through any suitable communication means, such as, for example, a telephone network, intranet, Internet, point of interaction device (point of sale device, personal digital assistant, cellular phone, kiosk, etc.), online communications, off-line communications, wireless communications, and/or the like. One skilled in the art may also appreciate that, for security reasons, any databases, systems, or components of the present invention may consist of any combination of databases or components at a single location or at multiple locations, wherein each database or system includes any of various suitable security features, such as firewalls, access codes, encryption, decryption, compression, decompression, and/or the like.

The systems may be suitably coupled to the network via data links. A variety of conventional communications media and protocols may be used for data links. For example, a connection to an Internet Service Provider (ISP) over the local loop as is typically used in connection with standard modem communication, cable modem, Dish networks, ISDN, Digital Subscriber Line (DSL), or various wireless communication methods. The merchant system might also reside within a local area network (LAN) that interfaces to the network via a leased line (T1, D3, etc.). Such communication methods are well known in the art and are covered in a variety of standard texts. *See, e.g.*, Gilbert Held, "Understanding Data Communications" (1996), hereby incorporated by reference.

The computing units may be connected with each other via a data communication network. The network may be a public network and assumed to be insecure and open to eavesdroppers. In the illustrated implementation, the network may be embodied as the Internet. In this context, the computers may or may not be connected to the Internet at all times. For instance, the customer computer may employ a modem to occasionally connect to the Internet, whereas the bank computing center might maintain a permanent connection to the Internet. Specific information related to the protocols, standards, and application software utilized in connection with the Internet may not be discussed herein. For further information regarding such details, see, for example, Dilip Naik, "Internet Standards and Protocols" (1998); "Java 2 Complete," various authors (Sybex 1999); Deborah Ray and Eric

Ray, "Mastering HTML 4.0" (1997); Loshin, "TCP/IP Clearly Explained" (1997). All of these texts are hereby incorporated by reference.

It may be appreciated that many applications of the present invention could be formulated. One skilled in the art may appreciate that a network may include any system for exchanging data or transacting business, such as the Internet, an intranet, an extranet, WAN, LAN, satellite communications, and/or the like. It is noted that the network may be implemented as other types of networks, such as an interactive television (ITV) network. The users may interact with the system via any input device such as a keyboard, mouse, kiosk, personal digital assistant, handheld computer (*e.g.*, Palm Pilot®), cellular phone and/or the like. Similarly, the invention could be used in conjunction with any type of personal computer, network computer, workstation, minicomputer, mainframe, or the like running any operating system such as any version of Windows, Windows NT, Windows2000, Windows 98, Windows 95, MacOS, OS/2, BeOS, Linux, UNIX, Solaris or the like. Moreover, although the invention is frequently described herein as being implemented with TCP/IP communications protocols, it may be readily understood that the invention could also be implemented using IPX, Appletalk, IP-6, NetBIOS, OSI or any number of existing or future protocols. Moreover, the present invention contemplates the use, sale or distribution of any goods, services or information over any network having similar functionality described herein.

In accordance with various embodiments of the invention, the Internet Information Server, Microsoft Transaction Server, and Microsoft SQL Server, are used in conjunction with the Microsoft operating system, Microsoft NT web server software, a Microsoft SQL database system, and a Microsoft Commerce Server. Additionally, components such as Access or SQL Server, Oracle, Sybase, Informix MySQL, Interbase, etc., may be used to provide an ADO-compliant database management system. The term "webpage" as it is used herein is not meant to limit the type of documents and applications that might be used to interact with the user. For example, a typical website might include, in addition to standard HTML documents, various forms, Java applets, Javascript, active server pages (ASP), common gateway interface scripts (CGI), extensible markup language (XML), dynamic HTML, cascading style sheets (CSS), helper applications, plug-ins, and/or the like.

The financial transaction instrument (*e.g.*, smart card, magnetic stripe card, bar code card, optical card, biometric device, radio frequency card or transponder and/or the like) may communicate to the merchant, information from one or more data sets associated with

the financial transaction instrument. In one example, membership data and credit card data associated with an account or card may be transmitted using any conventional protocol for transmission and/or retrieval of information from an account or associated transaction card (*e.g.*, credit, debit, loyalty, etc.). In one exemplary embodiment, the transaction instrument may be configured to communicate via RF signals. As such, the data contained on the instrument may be communicated via radio frequency signals.

A financial transaction instrument may include one or more physical devices used in carrying out various financial transactions. For example, a financial transaction instrument may include a rewards card, charge card, credit card, debit card, prepaid card, telephone card, smart card, magnetic stripe card, radio frequency card/transponder and/or the like. In yet another exemplary embodiment of the present invention, a financial transaction instrument may be an electronic coupon, voucher, and/or other such instrument.

The financial transaction instrument in accordance with this invention may be used to pay for acquisitions, obtain access, provide identification, pay an amount, receive payment, redeem reward points and/or the like. In the radio frequency ("RF") embodiments of the transaction instrument, instrument to instrument transactions may also be performed. See, for example, Sony's "Near Field Communication" ("NFC") emerging standard which is touted as operating on 13.56 MHz and allowing the transfer of any kind of data between NFC enabled devices and across a distance of up to twenty centimeters. See also, Bluetooth chaotic network configurations; described in more detail at

http://www.palowireless.com/infotooth/whatis.asp

which is incorporated herein by reference. Furthermore, data on a first RF device may be transmitted directly or indirectly to another RF device to create a copy of all or part of the original device.

Furthermore, financial transaction instrument as described herein may be associated with various applications which allow the financial transaction instruments to participate in various programs, such as, for example, loyalty programs. A loyalty program may include one or more loyalty accounts. Exemplary loyalty programs include frequent flyer miles, on-line points earned from viewing or purchasing products or websites on-line and programs associated with diner's cards, credit cards, debit cards, hotel cards, calling cards, and/or the like. Generally, the user is both the owner of the transaction card account and the participant in the loyalty program; however, this association is not necessary. For example, a participant in a loyalty program may gift loyalty points to a user who pays for a purchase

with his own transaction account, but uses the gifted loyalty points instead of paying the monetary value.

For more information on loyalty systems, transaction systems, and electronic commerce systems, see, for example, U.S. Utility Patent Application Serial No. 10/304,251, filed on November 26, 2002, by inventors Antonucci, et al., and entitled "System and Method for Transfer of Loyalty Points"; U.S. Continuation-In-Part Patent Application Serial No. 10/378,456, filed on March 3, 2003, by inventors Antonucci, et al., and entitled "System and Method for the Real-Time Transfer of Loyalty Points Between Accounts"; U.S. Patent Application Serial No. 09/836,213, filed on April 17, 2001, by inventors Voltmer, et al., and entitled "System And Method For Networked Loyalty Program"; U.S. Continuation-In-Part Patent Application Serial No. 10/027,984, filed on December 20, 2001, by inventors Ariff, et al., and entitled "System And Method For Networked Loyalty Program"; U.S. Continuation-In-Part Patent Application Serial No. 10/010,947, filed on November 6, 2001, by inventors Haines, et al., and entitled "System And Method For Networked Loyalty Program"; U.S. Continuation-In-Part Patent Application Serial No. 10/084,744, filed on February 26, 2002, by inventors Bishop, et al., and entitled "System And Method For Securing Data Through A PDA Portal"; the Shop AMEX™ system as disclosed in Serial No. 60/230,190, filed September 5, 2000; the Loyalty As Currency™ and Loyalty Rewards Systems disclosed in Serial No. 60/197,296, filed on April 14, 2000, Serial No. 60/200,492, filed April 28, 2000, Serial No. 60/201,114, filed May 2, 2000; a digital wallet system disclosed in U.S. Serial No. 09/652,899, filed August 31, 2000; a stored value card as disclosed in Serial No. 09/241,188, filed on February 1, 1999; a system for facilitating transactions using secondary transaction numbers disclosed in Serial No. 09/800,461, filed on March 7, 2001, and also in related provisional applications Serial No. 60/187,620, filed March 7, 2000, Serial No. 60/200,625, filed April 28, 2000, and Serial No. 60/213,323, filed May 22, 2000, all of which are herein incorporated by reference. Other examples of online loyalty systems are disclosed in Netcentives U.S. Patent No. 5,774,870, issued on June 30, 1998, and U.S. Patent No. 6,009,412, issued on December 29, 1999, both of which are hereby incorporated by reference.

Further still, a "code," "account," "account number," "identifier," "loyalty number" or "membership identifier," as used herein, includes any device, code, or other identifier/indicia suitably configured to allow the consumer to interact or communicate with the system, such as, for example, authorization/access code, personal identification number

(PIN), Internet code, other identification code, and/or the like that is optionally located on a rewards card, charge card, credit card, debit card, prepaid card, telephone card, smart card, magnetic stripe card, bar code card, radio frequency card and/or the like. The account number may be distributed and stored in any form of plastic, electronic, magnetic, radio frequency, audio and/or optical device capable of transmitting or downloading data from itself to a second device. A customer account number may be, for example, a sixteen-digit credit card number, although each credit provider has its own numbering system, such as the fifteen-digit numbering system used by an exemplary loyalty system. Each company's credit card numbers comply with that company's standardized format such that the company using a sixteen-digit format may generally use four spaced sets of numbers, as represented by the number "0000 0000 0000 0000." The first five to seven digits are reserved for processing purposes and identify the issuing bank, card type and etc. In this example, the last sixteenth digit is used as a sum check for the sixteen-digit number. The intermediary eight-to-ten digits are used to uniquely identify the customer. In addition, loyalty account numbers of various types may be used.

Further yet, the "transaction information" in accordance with this invention may include the nature or amount of transaction, as well as, a merchant, user, and/or issuer identifier, security codes, or routing numbers, and the like. In various exemplary embodiments of the present invention, one or more transaction accounts may be used to satisfy or complete a transaction. For example, the transaction may be only partially completed using the transaction account(s) correlating to the application tenant information stored on the transaction instrument with the balance of the transaction being completed using other sources. Cash may be used to complete part of a transaction and the transaction account associated with a user and the transaction instrument, may be used to satisfy the balance of the transaction. Alternatively, the user may identify which transaction account, or combination of transaction accounts, stored on the transaction instrument the user desires to complete the transaction. Any known or new methods and/or systems configured to manipulate the transaction account in accordance with the invention may be used.

In various exemplary embodiments, the financial transaction instrument may be embodied in form factors other than, for example, a card-like structure. As already mentioned, the financial transaction instrument may comprise an RF transponder, a speed pass, store discount card, or other similar device. Furthermore, the financial transaction instrument may be physically configured to have any decorative or fanciful shape including

key chains, jewelry and/or the like. The financial transaction instrument may furthermore be associated with coupons. A typical RF device which may be used by the present invention is disclosed in U.S. Application Serial No. 10/192,488, entitled "System And Method For Payment Using Radio Frequency Identification In Contact And Contactless Transactions," and its progeny, which are all commonly assigned, and which are all incorporated herein by reference.

As used herein, the term "data set" may include any set of information and/or the like which may be used, for example, in completing a transaction. For example, data sets may include information related to credit cards, debit cards, membership clubs, loyalty programs, speed pass accounts, rental car memberships, frequent flyer programs, coupons, tickets and/or the like. This information may include membership identifiers, account number(s), personal information, balances, past transaction details, account issuer routing number, cookies, identifiers, security codes, and/or any other information. The data set may additionally include an issuer defined management process for determining which subsets of data are to be provided to an issuer or merchant. In some instances, a data set may be associated with one or more account numbers corresponding to accounts maintained by the account issuer.

The various data sets associated with a financial transaction instrument may either be stored on the financial transaction instrument itself or remotely. In one exemplary embodiment, the financial transaction instrument itself is configured to store at least two data sets. In other exemplary embodiments, data sets may be stored in one or more databases and the data sets are affiliated with the financial transaction instrument. For example, a central database on the instrument may store multiple distinct data sets correlated with a unique issuer. The data sets stored on the remote database may be stored thereon, in such a manner as to mimic the corresponding data sets stored on the transaction instrument. The multiple distinct data sets may be accessed, for example, by a merchant system, whether stored on the transaction instrument or remote database stand alone device, and/or a computer user interface, via a network. In this example, the financial transaction instrument may include one or more user identifiers (*e.g.*, membership identifiers), which may be used to provide access to a subset of data included on the financial transaction instrument.

Various information and data are described herein as being "stored." In this context, "stored" may mean that the information is kept on a database. In accordance with the invention, a database may be any type of database, such as relational, hierarchical, object-

oriented, and/or the like. Common database products that may be used to implement the databases include DB2 by IBM (White Plains, New York), any of the database products available from Oracle Corporation (Redwood Shores, California), Microsoft Access or MSSQL by Microsoft Corporation (Redmond, Washington), or any other database product. A database may be organized in any suitable manner, including as data tables or lookup tables. Association of certain data may be accomplished through any data association technique known and/or practiced in the art. For example, the association may be accomplished either manually or automatically. Automatic association techniques may include, for example, a database search, a database merge, GREP, AGREP, SQL, and/or the like. The association step may be accomplished by a database merge function, for example, using a "key field" in each of the manufacturer and retailer data tables. A "key field" partitions the database according to the high-level class of objects defined by the key field. For example, a certain class may be designated as a key field in both the first data table and the second data table, and the two data tables may then be merged on the basis of the class data in the key field. In this embodiment, the data corresponding to the key field in each of the merged data tables is preferably the same. However, data tables having similar, though not identical, data in the key fields may also be merged by using AGREP, for example.

Although all data sets associated with a particular financial transaction instrument may be owned by the same owner, it is contemplated that in general, some of the data sets stored on the financial transaction instrument have different owners. Furthermore, the storage of data sets is configured to facilitate independent storage and management of the data sets on the financial transaction instrument. Further still, the data sets may be stored in distinct differing formats provided by the distinct issuer or data set owner (also called "issuer," herein). The owners of data sets may include different individuals, entities, businesses, corporations, software, hardware, and/or the like. However, one skilled in the art will appreciate that the owners may also include different divisions or affiliates of the same corporation or entity.

A data set may contain any type of information stored in digital format. For example, a data set may include account numbers, programs/applications, scripts, cookies, instruments for accessing other data sets, and/or any other information.

As discussed above, many issuers of existing financial transaction instruments utilize predetermined formats for account numbers, data and/or applications stored in association with the financial transaction instrument. Similarly, the data storage media associated with

these financial transaction instruments are typically configured to accommodate specific predetermined data formats. Thus, since the data format associated with a first issuer is often different from a data format of a second issuer, storage of multiple distinct data of differing formats on a single device provides complications for conventional systems. This is true since, each issuer typically maintains an account processing system that uses a processing protocol different from other issuers, and the information stored on the transaction card relative to the issuer must be formatted accordingly. As such, to ensure the security and integrity of the issuer-owned data, the loading of data on a transaction instrument is typically performed by an issuer or a third-party provider who typically uploads all related and similarly formatted data sets onto the transaction instrument. However, since the third party may typically only be authorized by the issuer to load issuer-owned data of similar format onto an issuer-provided transaction device, including differently formatted data sets on a single transaction device by the third party is often not permitted. More particularly, independent owners of data sets are often reluctant to conform their data set formats to a "standard format" because of the security advantages of maintaining a separate, distinct, often secreted format.

In contrast, and in accordance with an exemplary embodiment of the present invention, the format of the information stored in the present invention may vary from one data set to another. That is, the present invention permits the data to be stored on the financial transaction instrument in any format, and more particularly, in any format recognizable by the data owner/transaction instrument issuer. Thus, as noted, each data set may be used for a very wide variety of purposes including storage of applications, raw data, cookies, coupons, membership data, account balances, loyalty information, and/or the like.

In accordance with one aspect of the present invention, any suitable data storage technique may be utilized to store data without a standard format. Data sets may be stored using any suitable technique, including, for example, storing individual files using an ISO/IEC 7816-4 file structure; implementing a domain whereby a dedicated file is selected that exposes one or more elementary files containing one or more data sets; using data sets stored in individual files using a hierarchical filing system; data sets stored as records in a single file (including compression, SQL accessible, hashed via one or more keys, numeric, alphabetical by first tuple, etc.); block of binary (BLOB); stored as ungrouped data elements encoded using ISO/IEC 7816-6 data elements; stored as ungrouped data elements encoded using ISO/IEC Abstract Syntax Notation (ASN.1) as in ISO/IEC 8824 and 8825; and/or

other proprietary techniques that may include fractal compression methods, image compression methods, etc.

In one exemplary embodiment, the ability to store a wide variety of information in different formats is facilitated by storing the information as a Block of Binary (BLOB). Thus, any binary information can be stored in a storage space associated with a data set. As discussed above, the binary information may be stored on the financial transaction instrument or external to but affiliated with the financial transaction instrument. The BLOB method may store data sets as ungrouped data elements formatted as a block of binary via a fixed memory offset using either fixed storage allocation, circular queue techniques, or best practices with respect to memory management (*e.g.*, paged memory, memory recently used, etc.). By using BLOB methods, the ability to store various data sets that have different formats facilitates the storage of data associated with the financial transaction instrument by multiple and unrelated owners of the data sets. For example, a first data set which may be stored may be provided by a first issuer, a second data set which may be stored may be provided by an unrelated second issuer, and yet a third data set which may be stored, may be provided by a third issuer unrelated to the first and second issuers. Each of these three exemplary data sets may contain different information that is stored using different data storage formats and/or techniques. Further, each data set may contain subsets of data which also may be distinct from other subsets.

Even further, where the invention contemplates the use of a self-service user interaction device. In this context, the self-service user interaction device may be any device suitable for interacting with a transaction instrument, and receiving information from the transaction instrument user and providing the information to a merchant, account issuer, account manager, data set owner, merchant point of sale, and the like. For example, the self-service user interaction device may be a stand alone read write device, self-service Kiosk, merchant point of sale, read/write device, and the like. In one example, the self-service user interaction device may be configured to communicate information to and from the transaction device and to manipulate the data sets stored thereon. The self-service interaction device may be in communication with the various components of the invention using any communications protocol.

In general, systems and methods disclosed herein, are configured to facilitate the management of multiple distinct data sets associated with a financial transaction instrument. Management of data sets may include such steps as adding, augmenting, updating and/or

deleting data sets associated with the financial transaction instrument. Such manipulations of the data may occur without replacing or reissuing the financial transaction instrument. With reference to **FIG. 1**, an exemplary method 100 according to the present invention is shown. Method 100 may include issuing a financial transaction instrument issued to a transaction device user (step 110), enrolling multiple data set owners in a multiple account on a transaction device program (step 112), and managing data sets associated with the financial transaction instrument (step 120). In managing the data, the method 100 may determine, for example, whether the data should be added to a data set (step 130), modified (step 140) or deleted (step 150), as described more fully below. Once the data is appropriately managed, the financial transaction instrument user may present the data contained on the instrument to a merchant system for completion of a transaction.

The system may be further configured such that, during an exemplary transaction, data sets associated with the financial transaction instrument may be managed. For example, the user may be prompted (*e.g.*, on a screen, by electronic voice, by a store clerk, by a signal and/or the like) as to the possibility of adding, for example, a loyalty account to the same financial transaction instrument and the user may also be presented with terms and/or conditions in a similar or different manner. The user may be prompted at any time during the transaction, but preferably the user is prompted at the completion of the transaction. If the user accepts the invitation to add data to the financial transaction instrument, a new data set may be added (step 130) and/or an existing data set is updated (step 140). For example, if data is to be updated, the stand alone may locate appropriate data to be updated on the transaction device, and make the updates ("modifications") in accordance with data owner instructions. If the data is to be added, the stand alone device may be configured to provide any account information (*e.g.*, account identifier, security code, data owner routing number, etc.) to the transaction device for storage thereon. The stand alone may locate an appropriate database location on transaction instrument for storing the added data. The stand alone device facilitates storage of the data in a distinct location on the transaction device database, where the data is stored independently of any other data. In a preferred embodiment of the invention, the data is added to a database location on the transaction device which reserved for independently storing all data owned by a particular data set owner. Alternatively, the data may be stored in a distinct location on the transaction device, which is a separate location than is used to store any other data set. Further still, the

data set is stored in accordance with any storage protocol permitting the data to be stored and retrieved independently of other data.

The adding and updating of the data may be verified by the issuer, prior to making the modifications. If verified, all databases containing the data set to be updated or a mirror image of the data set to be updated, are modified in accordance with the user or issuer provided instructions, and/or the issuer defined data storage protocol or format.

In one exemplary embodiment, multiple account issuers may be enrolled in a multiple account management program using a financial transaction instrument in accordance with the invention (step 112). For example, permission for adding account issuer owned data may be obtained from the data set owner. The data set owner may then be requested to provide account information to be stored on a transaction instrument. The data set owner may then provide account information relative to a distinct user account for loading onto the transaction instrument in accordance with the present invention. The issuers may be enrolled prior to issuance of the instrument or the issuers may be enrolled after issuance. By enrolling in the management program, the issuer may provide authorization for including the issuer-owned data on the financial transaction instrument. The issuer-owned data may be included (*e.g.*, added, deleted, modified, augmented, etc.) on the transaction instrument using a stand alone interaction device, merchant system, or user personal computer interface upon presentment of the transaction device to the stand alone interaction device 290 (step 114). The stand alone interaction device may manipulate the issuer-owned data while preserving a format recognizable by an issuer account management system. For example, the stand alone device may identify the appropriate header or trailer associated with the data and add, delete or modify the data accordingly. The stand alone may manipulate the data using any manipulation instruction or protocol as provided by the data set owner so that the resulting manipulated data is in a format recognizable by the data set owner system. In this way, the stand alone device may manipulate the data while maintaining the data set owner's format. Alternatively, the interaction device may store the issuer-owned data on the transaction instrument in any format, provided that the issuer-owned data is provided to the issuer system (or to merchant system) in an issuer system (or merchant system) recognizable format.

It should be noted, that the financial transaction instrument may be issued with or without one or more data sets stored thereon. The financial transaction instrument may be issued using various techniques and practices now known or hereinafter developed wherein

an instrument is prepared (*e.g.*, embossed and/or loaded with data) and made available to a user for effecting transactions. Although the present invention may contemplate managing data sets (step 120) before issuing a financial transaction instrument (step 110), in various exemplary embodiments, by way of illustration, the data sets are described herein as being managed (step 120) after issuance (step 110).

At any time after issuance (step 110) of the financial transaction instrument, the financial transaction instrument may be used in a commercial transaction. In one exemplary embodiment of the present invention, a user communicates with a merchant, indicates a desire to participate in an issuer provided consumer program. The user may communicate with the merchant by, for example, presenting the transaction instrument to the merchant and indicting a desire to complete a transaction. The user may indicate his desire to complete a transaction using any conventional process used by the merchant. The user may further indicate that the user wished to complete the transaction using the financial transaction instrument.

During completion of the transaction, the user may present the financial transaction instrument to a merchant system. The financial transaction instrument is configured to communicate with the merchant, using any conventional method for facilitating a transaction over a network.

As stated above, in various embodiments of the present invention, the data can be stored without regard to a common format. However, in one exemplary embodiment of the present invention, the data set (*e.g.*, BLOB) may be annotated in a standard manner when provided for manipulating the data onto the financial transaction instrument. The annotation may comprise a short header, trailer, or other appropriate indicator related to each data set that is configured to convey information useful in managing the various data sets. For example, the annotation may be called a "condition header," "header," "trailer," or "status," herein, and may comprise an indication of the status of the data set or may include an identifier correlated to a specific issuer or owner of the data. In one example, the first three bytes of each data set BLOB may be configured or configurable to indicate the status of that particular data set (*e.g.*, LOADED, INITIALIZED, READY, BLOCKED, REMOVABLE, or DELETED). Subsequent bytes of data may be used to indicate for example, the identity of the issuer, user, transaction/membership account identifier or the like. Each of these condition annotations are further discussed herein.

The data set annotation may also be used for other types of status information as well as various other purposes. For example, the data set annotation may include security information establishing access levels. The access levels may, for example, be configured to permit only certain individuals, levels of employees, companies, or other entities to access data sets, or to permit access to specific data sets based on the transaction, merchant, issuer, user or the like. Furthermore, the security information may restrict/permit only certain actions such as accessing, modifying, and/or deleting data sets. In one example, the data set annotation indicates that only the data set owner or the user are permitted to delete a data set, various identified merchants are permitted to access the data set for reading, and others are altogether excluded from accessing the data set. However, other access restriction parameters may also be used allowing various entities to access a data set with various permission levels as appropriate.

The data, including the header or trailer may be received from a data set owner via any communication method described herein. The header or trailer may be appended to a data set to be modified, added or deleted, to indicate the action to be taken relative to the data set. The data set owner may provide the to a stand alone interaction device configured to add, delete, modify, or augment the data in accordance with the header or trailer. As such, in one exemplary embodiment, the header or trailer is not stored on the transaction device along with the associated issuer-owned data but instead the appropriate action may be taken by providing to the transaction instrument user at the stand alone device, the appropriate option for the action to be taken. However, the present invention contemplates a data storage arrangement wherein the header or trailer, or header or trailer history, of the data is stored on the transaction instrument in relation to the appropriate data.

In various exemplary embodiments, the steps of adding, deleting, augmenting and/or modifying data sets may be repeated. For example, first, second, and additional data sets may be added (step 130) to the financial transaction instrument in any order. In one exemplary embodiment of the present invention, the first data set is owned by a first data set owner (*i.e.*, first issuer) and the second data set is owned by a second data set owner (*i.e.*, second issuer). Furthermore, the system may include replacing a first data set with a subsequent data set by deleting a data set (step 150), then adding a data set (step 130).

With reference now to **FIG. 2**, in one exemplary embodiment of the present invention, a data set management system ("management system") 200 comprises a merchant system 220, various issuer systems 230, and a financial transaction instrument 240.

Management system 200 may further be accessed by a user 201 on a self-service interaction device, such as, for example, user computer 250 or via a transaction device such as, for example, kiosk 270, stand alone interaction device 290, automated teller, or the like. In these examples, communications between user computer 250 or kiosk 270 and merchant system 220 or issuer systems 230 may take place via, for example, a network 260. In various embodiments, merchant system 220, user computer 250 and/or kiosk 270 are configured to communicate with financial transaction instrument 240. For example, communication with the financial transaction instrument 240 may be facilitated by a point of read/write device 280, such as a merchant point of sale, merchant RFID reader, computer interface, or the like, configured to receive information provided by the financial transaction instrument 240.

In general, merchant system 220 is configured to interact with a user 201 attempting to complete a transaction, and to communicate transaction data to one or more of issuer systems 230. Issuer systems 230 are configured to interact with financial transaction instrument 240 to receive and/or exchange data facilitating a transaction. Merchant system 220 may be operated, controlled and/or facilitated by any merchant that accepts payment via a transaction instrument.

Merchant system 220 is configured to facilitate interaction with user 201, which may be any person, entity, software and/or hardware. The user 201 may communicate with the merchant in person (*e.g.*, at the box office), or electronically (*e.g.*, from a user computer 250 via network 260). During the interaction, the merchant may offer goods and/or services to the user 201. The merchant may also offer the user 201 the option of completing the transaction using a financial transaction instrument. The merchant system may provide the options to the user 201 using interactive user interface, suitable website or other Internet-based graphical user interface that is accessible by users.

Each user 201 may be equipped with a computing system to facilitate online commerce transactions. For example, the user 201 may have a computing unit in the form of a personal computer (*e.g.*, user computer 250), although other types of computing units may be used including laptops, notebooks, hand held computers, set-top boxes, and/or the like. The merchant system 220 may have a computing unit 222 implemented in the form of a computer-server, although other implementations are possible. The issuer system 230 may have a computing center such as a main frame computer. However, the issuer computing

center may be implemented in other forms, such as a mini-computer, a PC server, a network set of computers, or the like.

Issuer system 230 may be configured to manipulate a transaction account associated with the corresponding issuer-owned data stored on the transaction instrument 240 (or database 282, discussed below) in accordance with a related transaction. For example, the issuer system 230 may receive "transaction information" and manipulate an account status or balance in accordance with the information received. In accordance with the transaction amount, the issuer system 230 may, for example, diminish a value available for completing a transaction associated with the account, or the issuer system 230 may alter the information relative to the account user (*e.g.*, demographics, personal information, etc.).

It should be noted that issuer systems 230 may also be configured to interact with financial transaction instrument 240, directly or indirectly via database 282 or stand alone interaction device 290, to individually manage data sets on financial transaction instrument 240. For example, issuer systems 230 may manage data sets on database 282. In some embodiments, the data sets on database 282 may then be stored on financial transaction instrument 240 when the transaction instrument is presented. In other embodiments, issuer systems 230 may store data set information within their own systems which may communicate with the financial transaction instrument via user computer 250, kiosk 270, or merchant system 220. In such embodiments, the issuer system 230 may be configured to push the data set to the financial transaction instrument 240 via the stand alone interaction device 290, or the merchant system 220, kiosk 270, interaction device 290 or computer 250 which may be configured to pull such information from the issuer system 230.

In addition, the data may be manipulated using, for example, a stand alone interaction device 290 configured to communicate with at least one of the issuer systems 230 which may or may not be configured to communicate with a merchant system 220. The interaction device 290 may communicate with the issuer systems 230 using any of the aforementioned communication protocols, techniques and data links. The communication between the stand alone interaction device 290 and the issuer system 230 may be facilitated by a network 260. In an exemplary embodiment, the network 260 may be secure against unauthorized eavesdropping.

Interaction device 290 may provide instructions to the issuer systems 230 for requesting receipt of issuer-owned data, such as for example, account data, user member identification data, member demographic data, or the like, which the issuer wishes to store

on the financial transaction instrument 240. The interaction device 290 may communicate with the issuer systems 230 using an issuer recognizable communications protocol, language, methods of communication and the like, for providing and receiving data. In one exemplary embodiment, issuer-owned data is received by the interaction device 290 from issuer systems 230, and stored onto the financial transaction instrument 240. The data may be stored or manipulated in accordance with the issuer provided instructions, protocol, storage format, header or trailers received by the interaction device from issuer systems 230. The issuer-owned data may be stored on the financial transaction device 240 in any format recognizable by a merchant system 280, and further recognizable by issuer system 230. In one exemplary embodiment, the issuer owned data is stored using an issuer system 230 format which may be later formatted in merchant system 280 recognizable protocol when provided to the merchant system 280. In one embodiment, the issuer-owned information is stored on the financial transaction instrument 240 in the identical format with which it was provided by the issuer system 230. In that regard, interaction device 290 may be any device configured to receive issuer-owned data from an issuer system 230, and write the data to a database, such as, for example, a database on instrument 240 or database 282. Further, as described more fully below, the issuer-owned information may also be provided by the issuer 230 to a remote database 282 where the information is stored such that it mirrors the corresponding information stored on the transaction instrument 240.

Interaction device 290 may be initialized prior to use. For example, the interaction device 290 may be any system which may be initialized ("configured") to communicate with a merchant system 280. Where the interaction device is not initialized prior to attempting communications with the merchant system 280 or transaction instrument 240, the interaction device 280 may be initialized at the merchant system 280 location. The interaction device may be initialized using any conventional method for configuring device communication protocol.

As noted, in accordance with the invention a transaction instrument is provided which permits the storage and presentment of at least one of a plurality of data sets for completing a transaction. The data sets may be stored on the transaction device itself, or on a remote database, as described below. The data sets stored with regard to the transaction instrument may be modified, deleted, added or augmented, as required by the issuer or the user. For example, as owner of the data, an issuer may modify a data set at the issuer's discretion. The issuer may modify the data, data subsets, member identifier and/or

applications or data sets associated with its transaction account program. Such modifications may be completed or substantially completed in substantially real-time or at a later date, for example, when the transaction instrument is next presented.

In a typical example of issuer modification of the data sets, one or more data sets may be modified by the issuer system 230 directly via the issuer systems 230, upon presentment of the financial transaction instrument 240 to the system 230. That is, the user 201 may present the card to the issuer system 230, and the issuer system 230 may modify the issuer data stored thereon, using any issuer defined protocol. Alternatively, the modifications, or instructions for modification, may be initiated at the issuer system 230, and provided to the network 260. The modifications and/or modification instructions may additionally be provided to a suitable device configured to communicate with the transaction instrument 240, receive information regarding the data stored on instrument 240, and to write or overwrite the information contained on instrument 240. For example, as noted, interaction device 290 is a suitable interaction device which may be used to provide information to the transaction instrument 240 to modify the information stored thereon. Interaction device 290 may be any device capable of receiving data management instructions from the issuer systems 230 and for updating the data stored on the transaction instrument 240, in accordance with the instructions received. In this regard, the interaction device 290 may include any electronic components, databases, processors, servers and the like which may be used to modify the data stored on instrument 240 using any suitable data modification protocol as is found in the art. Preferably, the interaction device is configured to modify the data on the transaction device in accordance with a data owner defined protocol.

In one exemplary embodiment, the interaction device 290, may be configured to modify the transaction instrument's 240 issuer-owned data when the instrument 240 is initially configured, prior to providing the instrument 240 to the user 201. The interaction device 290 may additionally be configured to modify the issuer data on the instrument 240 when the instrument 240 is next presented, for example, to the stand alone interaction device 290. In this regard, the interaction device 290 may receive from multiple distinct issuer systems 230, via the network 260, the issuer provided modifications/instructions and may update the instrument 240 in real-time or substantially real-time. The modifications may be provided to the interaction device 290 for storage and later use when the instrument 240 is next presented. Alternatively, the interaction device 290 may be configured to retrieve the

instructions from the issuer system 230 when the instrument 240 is next presented to device 290. Further, where other devices, such as, for example, a kiosk 270, merchant point of interaction device, or the like, are likewise configured to modify the issuer data on instrument 240, the invention contemplates that the real-time or substantially real-time modifications noted above may be made using those devices in similar manner as is described with the interaction device 290.

Alternatively, the device to which the transaction instrument 240 may be presented, may not be equipped for updating or modifying the data stored on the instrument 240. For example, merchant system 220 may be any conventional merchant system which communicates to an issuer system 230, and which permits a user 201 to complete a financial transaction, but which is not configured to modify the issuer data contained on the transaction instrument. In general, conventional merchant systems are not configured to write or overwrite data included on the payment devices presented to the merchant system for processing. That is, the merchant system 220 may include little or no additional software to participate in an online transaction supported by network 260. Management of the data sets on transaction instrument 240 may be performed independent of the operation of the merchant system 220 (*e.g.*, via issuer system 230 or interaction device 290). As such, the present invention may require no retrofitting of the merchant system 220, to accommodate system 200 operation. Thus, where the merchant system 220 is not configured to modify the data on the transaction instrument, such modifications may be made as described above with respect to modifications being made at the interaction device 290 or by the issuer at the issuer 230 system.

The merchant system 220, kiosk 270, interaction device 290, may include additional means for permitting the transaction instrument user 201 to self-manage the data stored on the transaction instrument 240. In this case, the systems 220, 270, and 290 may include an additional user interface for use by the user 201 to identify the modification action to be taken. Where the systems 220, 270, and 290 are configured to communicate with the instrument 240 and to modify the data thereon, the modifications may be completed or substantially completed in real-time or substantially real-time. For example, the user 201 may present the transaction instrument 240 to one of the systems 220, 270, or 290, provide instructions to the system 220, 270, or 290 for modifying the data on instrument 240. The instructions may include, for example, "ADD," "DELETE," MODIFY," and the system 220, 270, or 290 may modify the data stored on the instrument 240 in accordance therewith. The

modifications may be made on the instrument in real-time or substantially real-time, for example, prior to permitting the instrument 240 to be used by the user 201. Alternatively, the modifications or instructions for modification may be provided by the user 201 to the merchant system 220 or kiosk 270, and the merchant system 220 or kiosk 270 may further provide the modifications/instructions to the network 260 for use in later modifying the data. For example, the modifications/instructions may be provided by system 220 or 270 to the issuer system 230 managed by the issuer owning the data to be modified. The issuer system 230 may provide the modifications to, for example, interaction device 290, for updating the transaction instrument 240 when next presented. The modifications/instructions may additionally be provided from the network 260 to a remote database, where the issuer-owned data corresponding to the transaction device and the issuer may be additionally stored (*i.e.*, database 282, described below). In one exemplary embodiment, the modifications/instructions may be stored at the issuer system 230, until such time as the transaction instrument 240 is next presented to a device configured to modify the data on the instrument. Once presented, the modifications/instructions may be provided to the device (*e.g.*, computer 250, interaction device 290, etc.) for modifying the instrument 240 data.

In another exemplary embodiment, the user 201 may self-manage the data sets by, for example, modifying the data sets using a conventional computer system 250, which may be in communication with the network 260. Computer system 250 may or may not be configured to interact with financial transaction instrument 240. Where the computer system 250 is not configured to interact with the transaction instrument 240, the user 201 may provide modifications or instructions to the issuer system 230 for later use in modifying the corresponding transaction instrument 240 data, for example, when the instrument 240 is next presented in similar manner as described above. Where the computer 250 is configured to interact with the financial instrument 240 to modify the data stored thereon, the user 201 may provide modifications/instructions to the computer 250 for modifying the data on the financial instrument in real-time or substantially real-time. That is, the computer 250 may be configured to interact with, read, add, delete, and/or modify the data sets on the instrument 240. Consequently, the computer 250 may receive modifications/instructions from the user 201 and perform the modifications accordingly, and may modify the data in real-time or substantially real-time. The computer 250 may additionally be configured to receive authorization of the modifications/instructions from issuer system 230 prior to making the user 201 requested changes. In one exemplary arrangement, the user 201 may

provide the modifications/instructions via the network 260 which may be additionally provided to the issuer system 230. The issuer system 230 may receive the user 201 modifications/instructions and verify whether the identified updates are available to the user 201 or if the identified updates are valid. If the identified updates are authorized, the issuer system 230 may update a data storage area associated with the transaction instrument 240. For example, the issuer system 230 may update an issuer database (not shown) containing data corresponding to the issuer-owned data associated with the transaction instrument 240. Alternatively, the issuer system 230 may provide modifications/instructions to a database positioned remotely to the issuer system 230 for use in modifying the data stored thereon, which is associated to the transaction instrument 230. As such, in accordance with the present invention, a user 201 may self-manage the data via, for example, the user computer 250, a kiosk 270, a merchant system 220, and/or a stand alone interaction device 290.

In one exemplary method of self-management, a user 201 logs onto a website via user computer 250, or onto a stand alone device, such as, for example, interaction device 290 or kiosk 270, and selects options for configuring data sets on a financial transaction instrument 240. The changes may be transmitted to the instrument 240 via an instrument reader/writer device 280 configured to communicate the data to instrument 240. In this context, the reader/writer device 280 may be any conventional transaction device reader or writer.

As noted, modifications to the data stored on the financial transaction instrument 240 may be made in real-time or substantially real-time when the instrument 240 is presented to the interaction device 290, or to a reader/writer device 280. However, as noted, various embodiments of the invention include a remote database 282 in communication with an issuer system 230 via a network 260. The remote database 282 may additionally be in communication with one of the user computer 250, kiosk 270, merchant system 220 and/or the interaction device 290, for variously receiving modifications or instructions for performing modifications to the data stored thereon. In addition, database 282 may contain a data storage area which "mirrors" the data stored on transaction instrument 240. In this context "mirrored" or "mirror" may mean that the data is stored on database 282 in substantially identical configuration and format as stored on the transaction instrument 240. As such, the present invention may be configured to permit modifications made to instrument 240 data to be mimicked on corresponding data locations on database 282. For example, the user 201 may self-manage the data on the database 282 via a user interface in

communication with the database 282 via the network 260. In one exemplary embodiment, the user 201 may communicate with a "website" which is used to manage the database 282, wherein database 282 is a database including unique locations for storing the issuer provided data and data sets correlative to the data and data sets stored on the transaction instrument 240. The website may include an account management application which permits the user 201 to select which user accounts to add, delete, or modify with respect to the instrument 240. That is, the user 201 may provide unique identifying information to the user computer 250 which may be recognized by the system (*e.g.*, issuer system 230 or remote system managing the database 282) managing database 282, thereby permitting the user 201 to access the data corresponding to the unique identifying information stored on database 282. Further, prior to permitting modifications to the database 282, the issuer owning the data may require authorization that such modifications may be performed. Further still, the present invention contemplates that database 282 may be self-managed by the user 201 in similar manner, where the merchant system 220, kiosk 270 and/or interaction device 290 are configured to provide modifications/instructions to the issuer systems 230 and database 282.

In another exemplary embodiment, database 282 serves as a temporary or redundant storage space for data sets. Thus, a "mirror image" of the data sets currently on the financial transaction instrument 240 may be maintained and/or updated at appropriate intervals for facilitating replacement of, for example, a damaged financial transaction instrument 240. As such, database 282 may be used, for example, for verifying the validity or accuracy of the information stored on the instrument 240. Also, changes to one or more data sets may be stored to database 282 pending an opportunity to update the financial transaction instrument 240. In various embodiments, such updating may take place in both directions similar to hot sync technology.

As noted, in some exemplary embodiments of the invention, authorization must be obtained from issuer systems 230 prior to making any modifications to the data contained on instrument 240 or database 282. Authorization may be obtained by requesting the authorization during the modification process. Authorization may be given where the user 201 provides the more appropriate security information, which is verified by the issuer system 230. The security information may be, for example, a security code granting access to the issuer-owned data on the instrument 240 or database 282. For example, a point-of-sale (POS) machine may be configured to allow the input of a code, or an answer to a prompt which is provided to and verified by issuer system 230. Once verified the

modification requested may be made to the data contained on the financial transaction instrument 240.

It should be noted that the authorization code may be used to permit the user 201 to select which issuer provided data to utilize for completion of a transaction. For example, a Point of Interaction Device (POI) device may be programmed to search the financial transaction instrument 240 for a data set containing a particular club membership data set, or to locate all available data sets for providing to a user 201 display available data sets to the user 201, thereby permitting the user 201 to select which data set to use to complete a transaction. If no data set is found, the POI device may alert the user 201 or prompt the merchant to alert the user 201 of the possibility of adding issuer-owned data to the financial transaction instrument 240. A positive response to this alert may cause the POI device to add an issuer data set to the instrument 240.

It is noted that the user 201 may already be a member of a membership program managed by an issuer system 230 in which case the associated user 201 membership data may be assigned to user 201 for inclusion on instrument 240. As such, the user 201 may be permitted to add the membership data set to the transaction instrument 240. Alternatively, the user may become a member by selecting to add the membership information to the financial transaction instrument 240, using the interactive device 290. In some embodiments, changes made to the data sets stored on the transaction instrument 240 may be updated to the financial transaction instrument 240 in real-time or substantially real-time, where the device 290 is in communication with the instrument 240. Or the changes may be made the next time the user 201 presents the financial transaction instrument 240 to stand alone interaction device 290 or to a kiosk 270, merchant system 220, or the like.

In another exemplary embodiment of the present invention, merchant system 220, kiosk 270, and/or user computer 250 may be configured to interact with financial transaction instrument 240 via a read/write device 280. Read/write device 280 may be any device configured to communicate with financial transaction 240. In one embodiment, read/write device 280 is configured to read and write to financial transaction instrument 240. For example, read/write device 280 may be a point of interaction magnetic card reader/writer. In another example, where the transaction instrument 240 includes a RF transmitter/receiver for communicating with system 200, read/write device 280 may include a mating transponder configured to receive and transmit issuer-owned data. Read/write device 280 may be configured to select data sets for use by a merchant using any suitable selection

technique including but not limited to proprietary commands or command sequences or use of ISO/IEC 7816-4 application selection sequences (*e.g.*, GET command).

In one exemplary embodiment, management of data sets is facilitated by annotating the data set with a status indicator (*e.g.*, condition header); (*e.g.*, LOADED, INITIALIZED, READY, BLOCKED, REMOVABLE or DELETED).

In this regard, a data set may have a LOADED status when the information related to that data set has been stored in association with the financial transaction instrument 240, but remains dormant. For example, a credit card account may have been added to the financial transaction instrument 240 that has not yet been activated. In some instances, the loaded data set needs to be further configured before it is ready to be used. For example, the data set may be modified to include a particular branch in a chain of franchise stores, the identification of a user's 201 primary care physician, or to reflect a user's 201 selection of a platinum membership status. In another example, a loyalty program may be added in association with a financial transaction instrument 240, and the data set marked LOADED. In another example, the user 201 may interact with a kiosk 270 or the like to input personal information and configure the loyalty program data set. Once such a data set has been configured, it may be annotated with an INITIALIZED status.

The status of a data set may be set as READY when the data set is ready to be utilized. For example, a user 201 may enter a secret code to indicate that the user 201 is ready to use the data set. In one example, the data set may be marked as READY when that data set is first accessed to perform a transaction. It will be noted that in accordance with other embodiments of the present invention, the status of a data set may be set at READY the moment it is loaded to the financial transaction instrument 240. Furthermore, it is possible to change the status between READY, LOADED, and INITIALIZED, under appropriate circumstances. Thus, the data sets may be managed through any one or more of these states and in various orders.

It may also be desirable to prevent use of a data set and/or the associated functionality for a period of time. Thus, the status indicator may be set to BLOCKED. The setting of the status indicator to BLOCKED may, for example, disable the use of the data set. In one exemplary embodiment, an appropriately configured financial transaction instrument reader is configured to recognize the BLOCKED status indicator when accessing the data set and to prevent use of that data set example.

In addition, for various reasons, a user 201 may desire to remove a data set from a transaction card 240. The user 201 may, for example, desire to use the available space on the transaction card 240 for other data sets, or may remove the data set for security reasons. Furthermore, circumstances may arise where the owner of the data set desires to remove the data set from one or more transaction devices 240, such as when a coupon expires. In these instances, the data set may be marked as REMOVABLE. Under these circumstances, the memory associated with the data set is available to receive information associated with future added data sets, but for the moment retains the old data set. A REMOVABLE data set may again be made READY under various configurations.

The REMOVABLE data set may subsequently be removed from the financial transaction instrument 240 and marked DELETED. A DELETED status indicator may be used to indicate that a portion of the financial transaction instrument 240 is available to store one or more data sets. It is noted that data sets may be directly deleted without going through the step of making the data set REMOVABLE. In one example, a data set may be removed from the financial transaction instrument 240 if the security of the account associated with the data set is compromised (*e.g.*, stolen password). Furthermore, as appropriate, the status of data sets may be changed to different states. Under appropriate circumstances one or more of any of the six status indicators LOADED, INITIALIZED, READY, BLOCKED, REMOVABLE, or DELETED or other suitable status indicators may be used to annotate a BLOB or other similar data set.

Although the data sets described herein may be managed without status indicators, nevertheless, such status indicators facilitate management of data. For example, regardless of a first data set owner's ability to interpret the information stored in a data set owned by another party, the first owner may interpret the status indicator to determine whether the data set is LOADED, DELETED, or the like. The determination that a data set is DELETED facilitates the addition of new data sets by independent owners without overwriting other data sets on the financial transaction instrument 240. In addition, the use of tags or status indicators may facilitate the use of global rules, which may simplify operations and/or commands. Status indicators may also enhance interoperability between data sets. Nevertheless, a data set owner may chose not to use a status indicator even if the opportunity is available.

Managing of the data sets (step 120) may include one or more of the following exemplary steps: add, update, modify, replace, verify, delete and/or the like. More

particularly, **FIG. 3** illustrates a general overview of an exemplary data set management method 300 comprising the steps of: loading a data set (step 310), initializing a data set (step 320), verifying availability of data set (step 330), and deleting a data set (step 340). In this manner, a data set may be added to a financial transaction instrument 240 and utilized until it is deleted. The adding and deleting steps are described in further detail with reference to **FIG.'s 4** and **5**. Furthermore, the ability to update, modify, replace and/or delete a data set may be subject to security requirements.

In one embodiment, the various processes may include a user 201 facilitating the input of information into a data management system to cause the data set to be loaded. The information may be inputted via keypad, magnetic stripe, smart card, electronic pointer, touchpad and/or the like, into a user computer 250, POS terminal, kiosk 270, ATM terminal and/or directly into the merchant system 220 via a similar terminal or computer associated with merchant server 222. The information may be transmitted via any network 260 discussed herein to merchant system 220 or issuer systems 230. In another embodiment, the merchant may enter the information into an issuer system 230 on behalf to the user 201. This may occur, for example, when the user 201 and/or issuer system 230 authorizes the management of data sets on financial transaction instrument 240 over a telephone and the service representative inputs the information. In this embodiment, the transaction instrument 240 may be updated at the next presentment opportunity such as when the user 201 attempts to compete a transaction using the transaction instrument 240.

Any suitable procedures may be utilized to determine whether a data set is currently ready for use and available (step 330). In one example, when a financial transaction instrument 240 is presented, the availability of the data set is verified by checking whether the data set has been corrupted or blocked (step 332), or deleted (step 333). For example, the data set may be checked to determine if the data set has been accessed or altered without permission ("corrupted") or if the data set exists or has been removed from the transaction device 240 ("deleted"). The check may be performed using any suitable protocol or comparing data. If the answer to these questions is no, then the data set is available and ready for use (step 334). If the data is corrupted or blocked, subroutines may be used to attempt to retry reading the data (step 336). If the data set is marked deleted or removable, subroutines will prevent access to the data set (step 335) and remove the data set (step 340). For example, a suitable subroutine may place a DELETE "marker" on the data set which prevents the data from being transmitted during completion of a transaction. The data set

may then be marked for deletion and deleted from the transaction device 240 at the next presentment of the device. In similar manner, where the data set is corrupted, a CORRUPTED marker may be appended to the data set and the data set is prevented from being transmitted during completion of a transaction. The marker may be a header or trailer as discussed herein.

Various methods may be used to add a data set to a financial transaction instrument 240 or to replace a data set on a financial transaction instrument 240. **FIG. 4** illustrates an exemplary method of adding a data set to a financial transaction instrument 240, including the general steps of presenting the financial transaction instrument (step 410), verifying the addition of the data set to the financial transaction instrument (step 420), placing the data set in a temporary holding area (step 430), and adding the data set (step 440).

More particularly, the user 201 presents the financial transaction instrument (step 410) to a device 280 configured to communicate with instrument 240. The user 201 may present financial transaction instrument 240 at a point of purchase or to an interaction device 240 or kiosk 270. For example, the user 201 may wave the RF transaction device 240 in front of a POI machine in a retail store, which is configured to receive data from the device 240. Alternatively, the user 201 may present the financial transaction instrument 240 at a self-service location such as a kiosk 270 in a mall. Moreover, the user 201 may present the financial transaction instrument 240 to a peripheral device associated with a personal computer, or the like.

The user 201 is then given the opportunity to add a data set to the transaction instrument 240. For example, device 280 may detect the absence of a particular data set on the transaction instrument by searching the transaction instrument 240 data base and comparing the existing data sets to the data set to be added. If the data set to be added is not found on the data base, the user 201 may be prompted to confirm the addition of this data set to the instrument (step 420). The user may be prompted via an interactive user interface displaying the option to add the data set. In one example, when a user 201 presents a financial transaction instrument 240 to a merchant, the card reader detects the absence of a loyalty data set and provides a message on a display to the user 201 or the store clerk indicating that the loyalty data set can be added if desired. The user 201 may answer in the negative and complete the purchase using typical transaction methods (step 425). Alternatively, if user 201 provides an affirmative response, the algorithm may prepare a data set for communication with the financial transaction instrument 240 (step 430). The process

may determine whether the data set (or information that could be used to create the data set) exists in some form or on some device other than on the financial transaction instrument 240 (step 432). Determining whether a data set exists may involve querying an issuer system 230, database 282, or the like. For example, the issuer system 230 may compare the data set to other data sets the issuer system 230 has assigned to a particular user 201. If the data set is not assigned to a particular user, then issuer system may determine that the data set is available for adding to the transaction instrument 240. Determining whether a data set exists may also take place when a store clerk verbally asks (or a screen prompts) the user 201 to present another card containing the information. For example, the data set may exist on a movie rental card and stored in magnetic stripe form, bar code, and/or the like.

If the data set exists in an accessible form, the data set may be captured (step 436). In this example, the user 201 may present the movie rental card and the data read from the movie rental card may then be stored in a data set associated with the financial transaction instrument 240. For example, the user 201 may desire to add a shopping loyalty card to the user's 201 financial transaction instrument 240. The user 201 may swipe, scan or otherwise present the loyalty card such that the data set from the loyalty card is captured. The system may be further configured such that the merchant, kiosk 270, or computer system may access an issuer system 230 to obtain information for creating the data set. Thus, if a user 201 does not have the movie rental card on the user's 201 person, the system 230 may prompt the clerk to request identifying/security information and to access the user's 201 account and therefore facilitate adding a movie rental data set associated with the user's 201 transaction instrument 240. Any other suitable methods of capturing data sets may also be used.

If the data set does not exist, a new data set may be created (step 434) for inclusion on the transaction instrument 240. Creation of the data set may, for example, involve filling out an application, providing name and address, creating an account, and/or the like. In either event, the pre-existing or newly created data set is temporarily held in a storage area (*e.g.*, database 282, local memory or the like) for transfer to the transaction instrument 240 (step 438). Additional data sets may be prepared for transmittal to transaction instrument 240 (step 439).

In this exemplary embodiment, the transaction instrument 240 is presented again to read/write device 280 (step 442). Read/write device 280 is configured to attempt to transfer the data set(s) to the transaction instrument 240 (step 444). For example, existing read/write

device 280 may be configured with software and/or hardware upgrades to transmit data to the transaction instrument 240. In one exemplary embodiment, if the data sets were not transferred correctly, the process may try the transfer again. In another exemplary embodiment, data sets are added one at a time or altogether. Thus, a user 201 may pass a card through a card reader/writer one or more times during the addition process. The transaction may be completed (step 425) using the new data set or another selected method of payment. The same steps may be used in a self-service embodiment, however, in one embodiment, no financial transaction takes place along with the addition of data sets. It should also be noted that under appropriate circumstances, a user 201 could add data sets at a point of purchase without actually completing a purchase.

In various exemplary embodiments, the user 201 and/or the owner of the data set may manage the data set (*i.e.*, steps 432-439) in advance of presenting the transaction instrument 240. For example, a user 201 on user computer 250 may choose to add or delete data sets via a website configured for management of data sets. In another example, an issuer system 230 may add functionality to an account and may desire to update the data set associated with that account. In either example, data sets that have been prepared in advance, may be ready for transmission upon presentment of the transaction instrument 240. The transmission of the data sets may be transparent to the user 201. For example, the user 201 may present the transaction instrument 240 (step 442) to complete a purchase and the waiting data sets may automatically be added to the user's 201 card (step 440).

Similar steps may be taken to replace or update data sets with new information. For example, a user 201 at a point of interaction may be informed of an upgrade in functionality associated with an account or other data set. Following similar steps as discussed with reference to **FIG. 4**, the existing data set on the transaction instrument 240 is replaced with a new data set. Moreover, depending on permission rights and/or hierarchies in place, if any, an existing data set may be replaced with an unrelated data set. Other methods of adding and replacing data sets may also be used to manage data sets on a transaction instrument 240.

Furthermore, data sets may be deleted using any suitable techniques. For example, **FIG. 5** illustrates an exemplary data set deletion method 500. The user 201 presents transaction instrument 240 at a point of purchase, self-service location, or the like (step 510). The POS device may be configured to facilitate the user 201 providing input regarding deletion of a data set (step 520). For example, the POS device may ask the user 201, via a

test screen, whether the user 201 desires to manage the data sets on the transaction instrument 240. Through a series of menus and/or questions, the user 201 may identify data sets that the user 201 desires to delete.

Furthermore, the POS device may be configured to interrogate a database 282 or specific issuer systems 230 to determine whether the deletion of a data set has been requested earlier. If the user 201 requests deletion of one or more data sets, the data sets are then identified (step 530). It will be noted that step 530 may occur concurrently with step 520 or the user 201 may request deletion of a specific account at this step. In other embodiments, accounts may be deleted per predefined rules or policies, and/or the like. Upon presenting the transaction instrument 240 again, the identified data set(s) are removed from the transaction instrument 240 (steps 540 and 550). Other methods of deleting data sets may also be used to manage data sets on a transaction instrument 240.

In an exemplary embodiment, management of the data sets may further include selecting preferences for use of the data sets. For example, a user 201 may indicate a desire to use data set A, associated with a low interest rate credit card, as a first option, but to use data set B, associated with a higher interest rate credit card when data set A is not available. In another example, one data set may be used for purchases of gas while another data set may be used for purchasing travel tickets. The consumer data set preferences may be stored on the transaction instrument 240 as a data set. In this example, when the card is presented, all available data sets are read and the card reader device determines which data sets are to be used based in part on the preferences stored on the card, which preferences may be updated from time to time.

In one exemplary embodiment of the present invention, transaction instrument 240 is a RF device configured to transmit and receive information via RF frequency. The RF instrument 240 may be embodied in any form factor allowing presentment of the instrument 240 for payment. Typical form factors may include a watch, card, FOB, or the like. For ease in understanding, the RF transaction instrument may be referred to, herein, as a "FOB."

The FOB may be configured to communicate via a radio frequency transponder to the merchant systems or account systems. In yet another embodiment, the FOB may be configured to comprise two or more antennae that are both configured to send and receive information and the FOB may be responsive to different RF frequencies. In this exemplary embodiment, each antenna may be configured to communicate using a particular protocol and/or frequency. Thus, the FOB may be configured to communicate with two or more

interaction devices 280 that each communicate with the FOB using different transmission frequencies. For more information on dual antenna FOBs, see U.S. Patent Application Serial No. 10/192,488, filed July 9, 2002, by inventors Michael J. Berardi, et al., and entitled "System and Method for Payment Using Radio Frequency Identification in Contact and Contactless Transactions" and its progeny, which are hereby incorporated by reference.

As noted, the data associated with the transaction instrument 240 may be modified by the user 201 and/or by the issuer system 230. **FIG.'s 6** and **7** respectively, depict exemplary methods for user 201 and issuer system 230 data management. For example, with respect to user 201 self-management, the issuer system 230 may provide the user 201 with a transaction instrument 240 (step 602). The instrument 240 may be provided with pre-stored issuer-owned data, or the instrument 240 may be configured to permit the user 201 to add the data at a later date. The user 201 may the present the transaction instrument 240 to read/write device 280 for initiating the self-management process (step 604). The read/write device 280 may then read the data on the transaction instrument 240, and provide the data to an interaction device 290 for displaying to the user 201 (step 606). Alternatively, the interaction device 290 may provide the user 201 a list of available data to be added to the instrument 240.

The user 201 may then be permitted to identify which data the user 201 wishes to modify (step 608). Identification of the data may include providing the data with a trailer or header indicating the action to be taken (*e.g.*, add, delete, augment, overwrite, etc.). The header and an indicator of the data to be modified may then be provided to the issuer system 230 (step 610) for verification as to whether such desired modifications are available to the user 201 (step 612). If the desired modifications are not available, the modifications will not be made and the user 201 is notified accordingly (step 614). The user 201 may then be permitted to identify whether other data is to be modified (step 616). If so (step 608), the interaction device 290 may provide a request for modification to the issuer system 203 (step 610) and the verification process is repeated.

Alternatively, where the issuer system 230 verifies that the modifications may be made (step 612), the interaction device 290 may make the modifications to the appropriate data on the transaction instrument 240 (step 618). Additionally, where the system 200 includes a remote database 282 for storing a mirror image of the data contained on transaction instrument 240 (step 620), the interaction device 290, or issuer system 230, may facilitate modification of the remote database 282 (step 622). The user 201 may then be

permitted to select other data sets to modify (step 616), in similar manner as was described above.

In either case, where the modifications are complete, the user 201 may then present the transaction instrument 240 to a merchant for use in completing a transaction.

FIG. 7 depicts an exemplary method wherein the issuer system 230 manages the data contained on the transaction instrument 240. For example, the issuer may identify on the issuer system 230 which data sets are to be modified (step 702). The modifications may then be made to the corresponding data set stored on the issuer system 230 (step 706). Where the system 200 includes a remote database 282, the issuer system 230 may provide the modifications/instructions to the database 282 for updating the database 282 accordingly (step 706).

In addition, the issuer system 230 may query as to whether the issuer system 230 is in possession of the transaction instrument 240 for making the modifications to the data set on the instrument 240 in real-time or substantially real-time (step 708). If so, the modifications are made accordingly (step 710) and the instrument 240 may then be provided to the user 201 for use in completing a transaction using the distinct data sets modified (step 712).

Where the issuer system 230 is not in possession of the transaction instrument 240 at the time the issuer determines that modifications to the data on the instrument 240 are to be made (step 708), the modifications may be made on the issuer system 230 (step 704), and may be placed in queue, for uploading to the transaction instrument 240 when it is next presented to the issuer system 230 or to an appropriate read/write device 280 (step 714). When the transaction instrument 240 is presented thusly (step 716), the issuer system 230 may be notified that the transaction instrument 240 is available for modifying, and the issuer system 230 may then provide the instructions for modification (*e.g.*, modified data including headers) to the appropriate read/write device 280 for modifying the transaction instrument 240 (step 718). The transaction instrument 240 may then be provided to the user 201 for use in completing a transaction (step 712).

As noted, the transaction instrument 240 may include multiple data sets which correspond to distinct issuer systems 230, and which may be used to complete a transaction. The user 201 may be permitted to choose which data set to use for transaction completion. **FIG. 8** illustrates an exemplary method by which the user 201 may choose which of the data sets to use to complete a transaction. For example, the user 201 may present the instrument

240 to a merchant system 220 for use in completing a transaction (step 802). The merchant system 220 may then read the data stored on the transaction instrument 240 and report to the user 201 all distinct data sets which may be used to complete a transaction (804). The user 201 may then select the appropriate data set (step 806) and the transaction is completed accordingly (step 808).

It should be noted that completion of a transaction may be performed under any business as usual standard employed by the merchant and/or issuer system 230. For example, the merchant server 222 may be configured to communicate transaction data to the appropriate issuer system 230, in real-time or substantially real-time, or by using batch processing at the end of each day. Any suitable means for delivering the transaction data to the issuer systems 230 may be used. In one exemplary embodiment of the present invention, the transaction data may be delivered to the issuer system 230 via a network 260. The issuer system 230 may receive the transaction information and process the transaction under issuer defined protocol independent of any other protocol used by other issuers to process a transaction. The issuer system 230 may receive the transaction data and provide the merchant with the appropriate satisfaction for the transaction.

It should be appreciated that the particular implementations shown and described herein are illustrative of the invention and its best mode and are not intended to otherwise limit the scope of the present invention in any way. Indeed, for the sake of brevity, conventional data networking, application development and other functional aspects of the systems (and components of the individual operating components of the systems) may not be described in detail herein. It should be noted that many alternative or additional functional relationships or physical connections may be present in a practical data set management system.

As may be appreciated by one of ordinary skill in the art, the present invention may be embodied as a method, a data processing system, a device for data processing, and/or a computer program product. Accordingly, the present invention may take the form of an entirely software embodiment, an entirely hardware embodiment, or an embodiment combining aspects of both software and hardware. Furthermore, the present invention may take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the storage medium. Any suitable computer-readable storage medium may be utilized, including hard disks, CD-ROM, optical storage devices, magnetic storage devices, and/or the like.

These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer-implemented process such that the instructions which execute on the computer or other programmable apparatus include steps for implementing the functions specified in the flowchart block or blocks.

It should be noted that although the present invention is discussed with respect to Internet Service Providers, and systems and networks which may communicate via a leased line (T1, D3, TCP/IP etc.), the invention is not so limited. The present invention contemplates conventional protocol, networks and systems which support a wide range of data transfer. For example, in accordance with this invention, a transaction may be completed using telephone lines connecting long distance carrier systems. In this instance, the issuer-owned data which may be included on transaction instrument 240 using any of the methods discussed herein, may be an account number which corresponds to long distance calling time such as may be done with a conventional calling card.

Where the transaction instrument 240 is loaded with several distinct data sets, each corresponding to a distinct data set owner operating on distinct and non-compatible communications network, the user of the transaction instrument 240 may use the instrument to complete long distance calls on each of the distinct communications network, independently of the other. This is especially useful for a transaction instrument 240 user who may travel to different locations, where the different locations support different long distance communications network. In this exemplary embodiment, the present invention enables a user to anticipate which communications network is available in many different travel destinations, and include the corresponding mating data set on transaction instrument 240 prior to beginning travel. In this way, the transaction instrument 240 user may be prepared to use the transaction instrument 240 as a long distance calling card irrespective of his anticipated travel destination.

In the foregoing specification, the invention has been described with reference to specific embodiments. However, it may be appreciated that various modifications and

changes can be made without departing from the scope of the present invention. For example, the issuer may reserve all management of data stored on the transaction instrument, thereby prohibiting the user from modifying the issuer owned data thereon. Further, each issuer system may have its own data management protocol, which necessarily does not interfere with or depend upon the data management protocol of other issuer systems. As such, the specification and figures are to be regarded in an illustrative manner applicable irrespective of the data processing protocol used by a data set owner, rather than a restrictive one, and all such modifications are intended to be included within the scope of present invention. Accordingly, the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given above. For example, the steps recited in any of the method or process claims may be executed in any order and are not limited to the order presented.

Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any element(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as critical, required, or essential features or elements of any or all the claims. As used herein, the terms "comprises," "comprising," or any other variation thereof, are intended to cover a non-exclusive inclusion, such that a process, method, article, or apparatus that comprises a list of elements does not include only those elements but may include other elements not expressly listed or inherent to such process, method, article, or apparatus. Further, no element described herein is required for the practice of the invention unless expressly described as "essential" or "critical."

Claims

What is claimed is:

1. A method for facilitating the management of a plurality of data sets on a transaction instrument, the method comprising the steps of:

facilitating enrollment of a first data set owner and a second data set owner in multiple transaction accounts on a transaction instrument program;

facilitating adding to a database, a first data set of a first format at the transaction instrument, wherein said first data set is owned by said first data set owner;

facilitating adding to a database, a second data set of a second format at the transaction instrument, wherein said second data set is owned by said second data set owner, wherein said first owner is distinct from said second owner, and said first format is different from said second format,

wherein said first data set is stored in accordance with said first format, and said second data set is stored in accordance with said second format; and

facilitating modifying at least one of said first and second data set on said database.

2. A method of claim 1, wherein said database is a remote database remote from said transaction instrument.

3. A method of claim 1, wherein said database is a RF transaction instrument database.

4. The method of claim 1, wherein said first data set is added before issuance of the financial transaction instrument by an issuer, and wherein said second data set is added after issuance of the financial transaction instrument.

5. The method of claim 1, further comprising facilitating the adding of a first condition header to at least one of said first and second data sets, said header added independent of said first or second format.

6. The method of claim 5, further comprising facilitating the modification of at least one of said first and second data sets in accordance with said condition header.

7. The method of claim 6, further comprising the step of facilitating the deleting of said second data set in accordance with said condition header.

8. The method of claim 5, further comprising the step of facilitating the adding of a third data set to the financial transaction instrument; wherein said third data set is stored, at least partially, in at least a portion of the data storage space that was used to store said second data set.

9. The method of claim 1 further comprising facilitating the adding, by an interaction device, of a third data set of a third format to the financial transaction instrument, wherein said third data set is owned by said first owner.

10. The method of claim 1, wherein said first and second data sets are each stored as a Block of Binary.

11. The method of claim 7, further comprising the steps of:

facilitating the updating of said first data set; and

facilitating the deleting of said first data set from the financial transaction instrument.

12. The method of claim 11, wherein said first data set is stored in a first memory area and wherein said first memory area is reusable by a third data set after said first data set is deleted from said first memory area.

13. The method of claim 10, wherein said first and second block of binary are annotated with at least one status indicator for indicating the action to be taken with the block of binary.

14. The method of claim 13, wherein said updating and deleting of said first data set is accomplished without the involvement of an issuer of the financial transaction instrument and independent of any other data set owner.

15. A system for facilitating the management of a plurality of data sets stored on a RF operable transaction instrument,

said transaction instrument comprising

at least one data storage area configured to store a first data set in a first format and a second data storage area configured to store a second data set in a second format different from said first format,

said first data set associated with a first owner and said data storage area configured to store said first data set in said first format independent of said second data set, and,

said second data set associated with said second owner and said data storage area configured to store said second data set in said second format independent of said first data set;

a remote database configured to store a exact duplicate representation of said first data storage area and said second data storage area; and

an interaction device configured to read and write data to said transaction device storage area, said interaction device configured to receive said first and second data sets from said remote data base, and to provide said first and second data sets to said transaction instrument data base.

16. The system of claim 15 wherein at least one of said first and second data sets stored on said remote database is annotated with a condition header.

17. The system of claim 16 wherein at least one of said first and second data sets is modified on said remote database in accordance with said condition header.

18. The system of claim 16 wherein at least one of said first and second data sets is modified on said RF transaction database in accordance with said condition header.

19. The transaction instrument of claim 16, wherein said condition header is at least one of the following status conditions: loaded, initialized, ready, blocked, removable, and deleted.

20. The transaction instrument of claim 14, further comprising a first data storage area, wherein said first data storage area is configured to receive data of any format.

21. The transaction instrument of claim 14, wherein said transaction instrument includes a radio frequency operable transponder.

22. A data management system comprising:

a transaction instrument associated with a first data set of a first format and a second data set of a second format, wherein said first data set is owned by a first owner and said second data set is owned by a second owner different from the first, and wherein said transaction instrument is configured to facilitate at least one of a first data set owner and a user of said transaction instrument in managing said first data set without involvement of an issuer of said transaction instrument;

a database configured to store said first and second data sets, said first data set having a format different from said second format, said database configured to store said first data set in accordance with said first format, and said database configured to store said second data sets in accordance with said second format; and

an interaction device configured to communicate with said financial transaction instrument and said database, said interaction device configured to receive said first and second data set and to provide said first and second data to said transaction instrument.

23. The system of claim 22, wherein said first and second data sets are managed via a self-service user interaction device.

24. The system of claim 22, wherein said interaction device is configured to modify at least one of said first and second data sets, said modifying including at least one of the following management actions: adding, updating, and deleting said first data set.

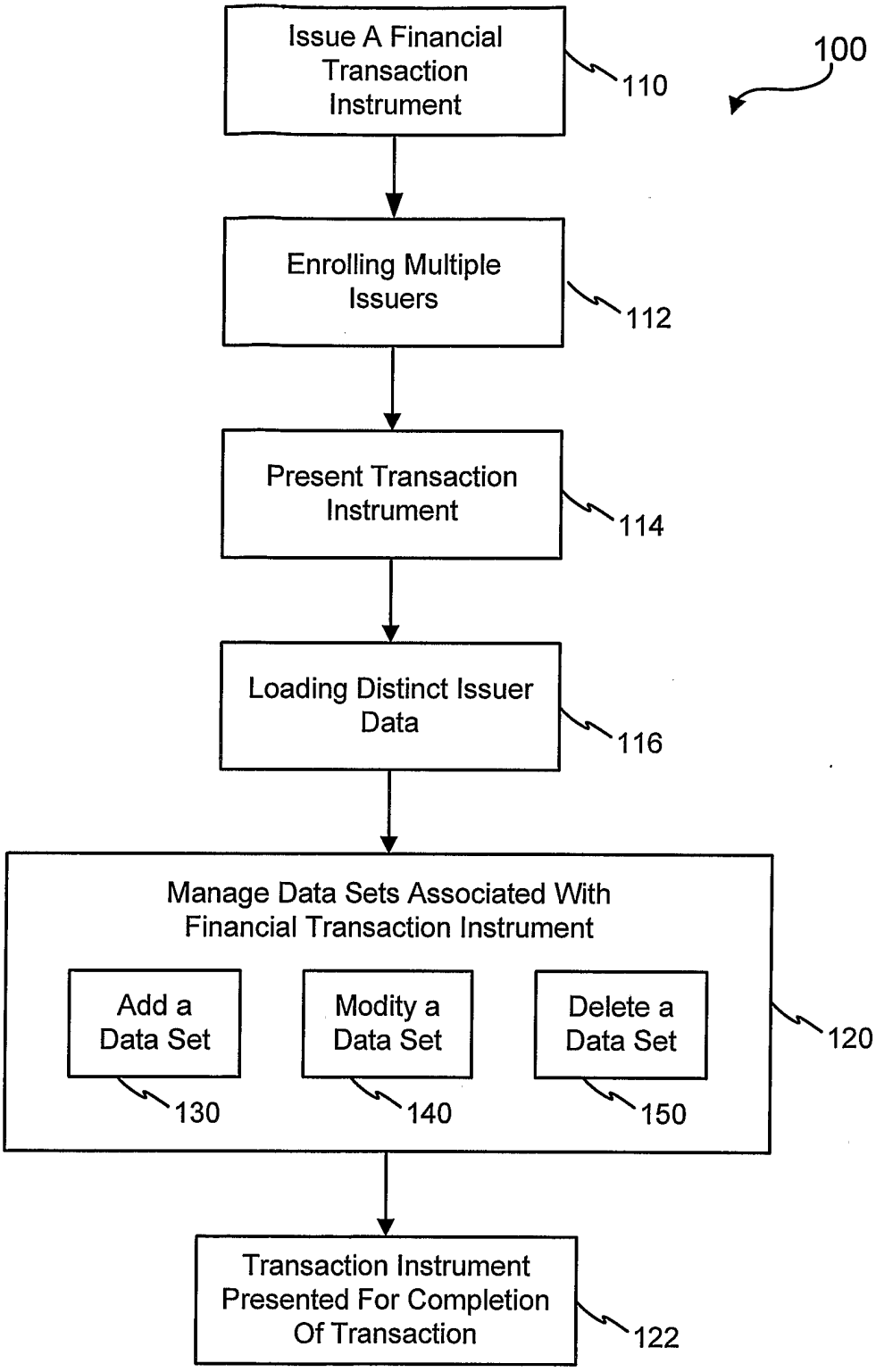
Issue A Financial Transaction Instrument
110
100
Enrolling Multiple Issuers
112
Present Transaction Instrument
114
Loading Distinct Issuer Data
116
Manage Data Sets Associated With Financial Transaction Instrument
Add a Data Set
130
Modity a Data Set
140
Delete a Data Set
150
120
Transaction Instrument Presented For Completion Of Transaction
122

FIG. 1

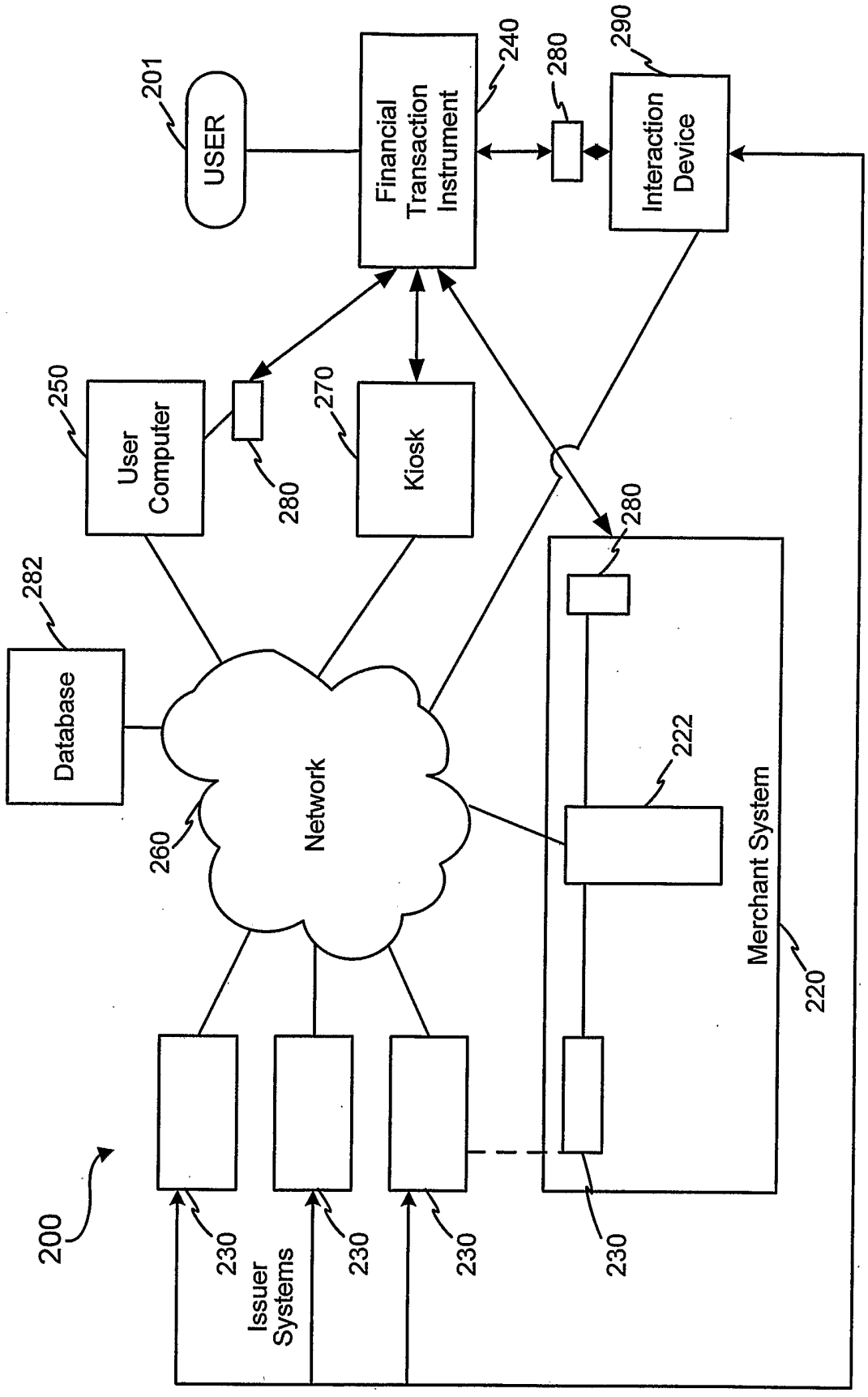
201
USER
Financial Transaction Instrument
240
280
290
Interaction Device
250
User Computer
280
270
Kiosk
280
282
Database
Network
260
222
Merchant System
220
200
230
Issuer Systems
230
230
230

FIG. 2

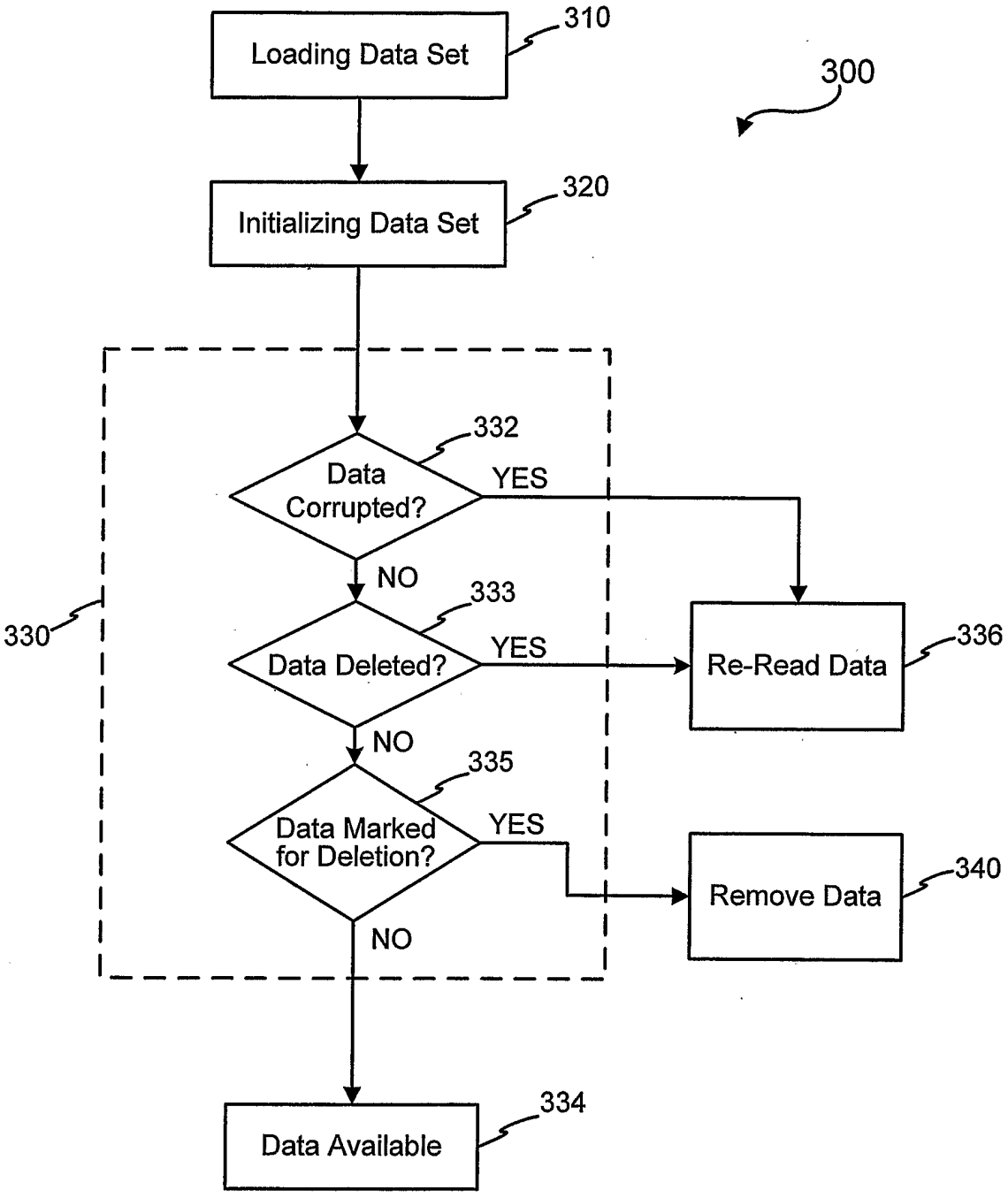
Loading Data Set
310
300
Initializing Data Set
320
332
Data Corrupted?
YES
NO
333
Data Deleted?
YES
336
Re-Read Data
330
NO
335
Data Marked for Deletion?
YES
340
Remove Data
NO
Data Available
334

FIG. 3

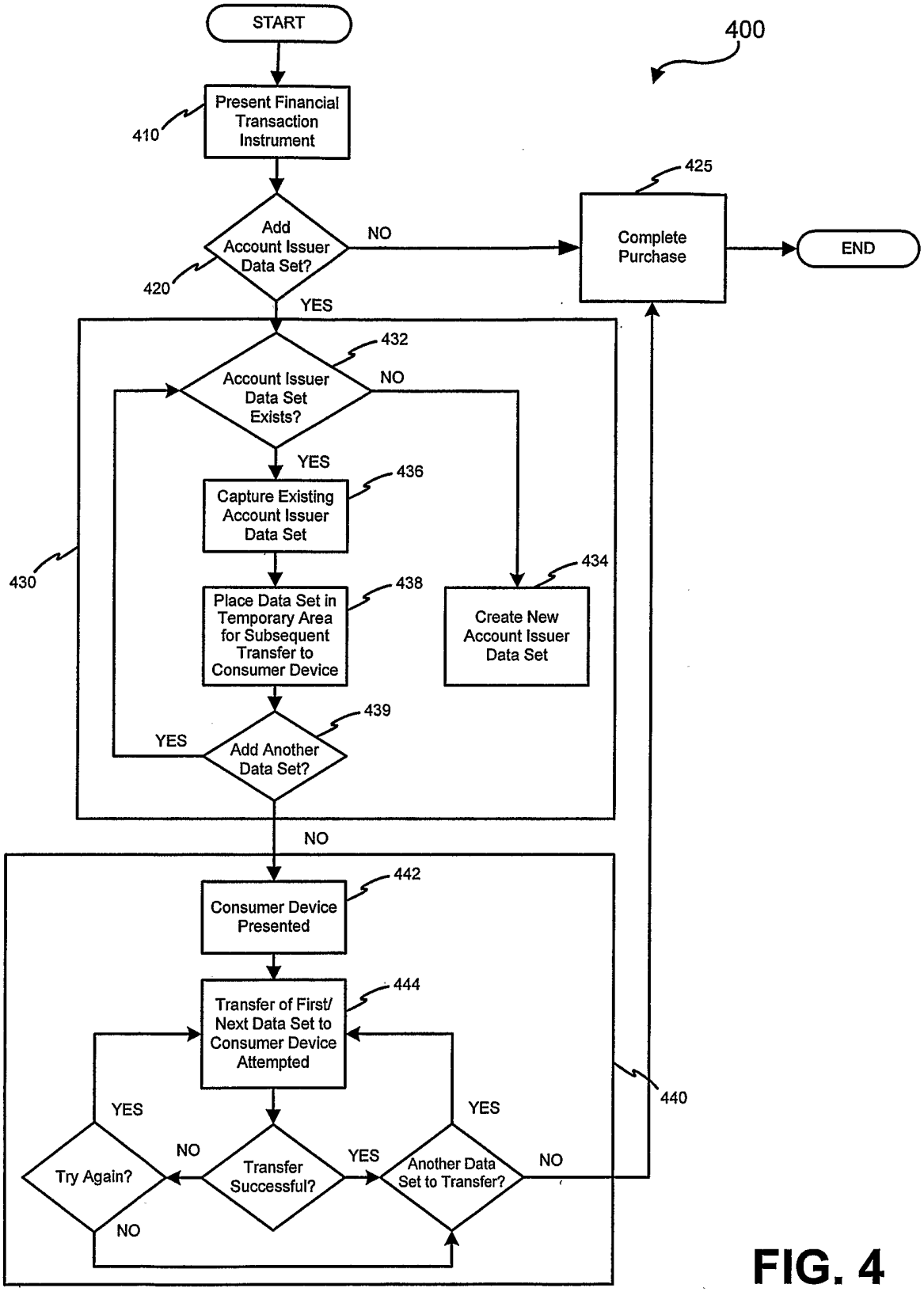
START
400
Present Financial Transaction Instrument
410
Add Account Issuer Data Set?
420
NO
425
Complete Purchase
END
YES
Account Issuer Data Set Exists?
432
NO
YES
Capture Existing Account Issuer Data Set
436
430
Place Data Set in Temporary Area for Subsequent Transfer to Consumer Device
438
Create New Account Issuer Data Set
434
Add Another Data Set?
439
YES
NO
Consumer Device Presented
442
Transfer of First/ Next Data Set to Consumer Device Attempted
444
440
YES
YES
Try Again?
NO
Transfer Successful?
YES
Another Data Set to Transfer?
NO
NO

FIG. 4

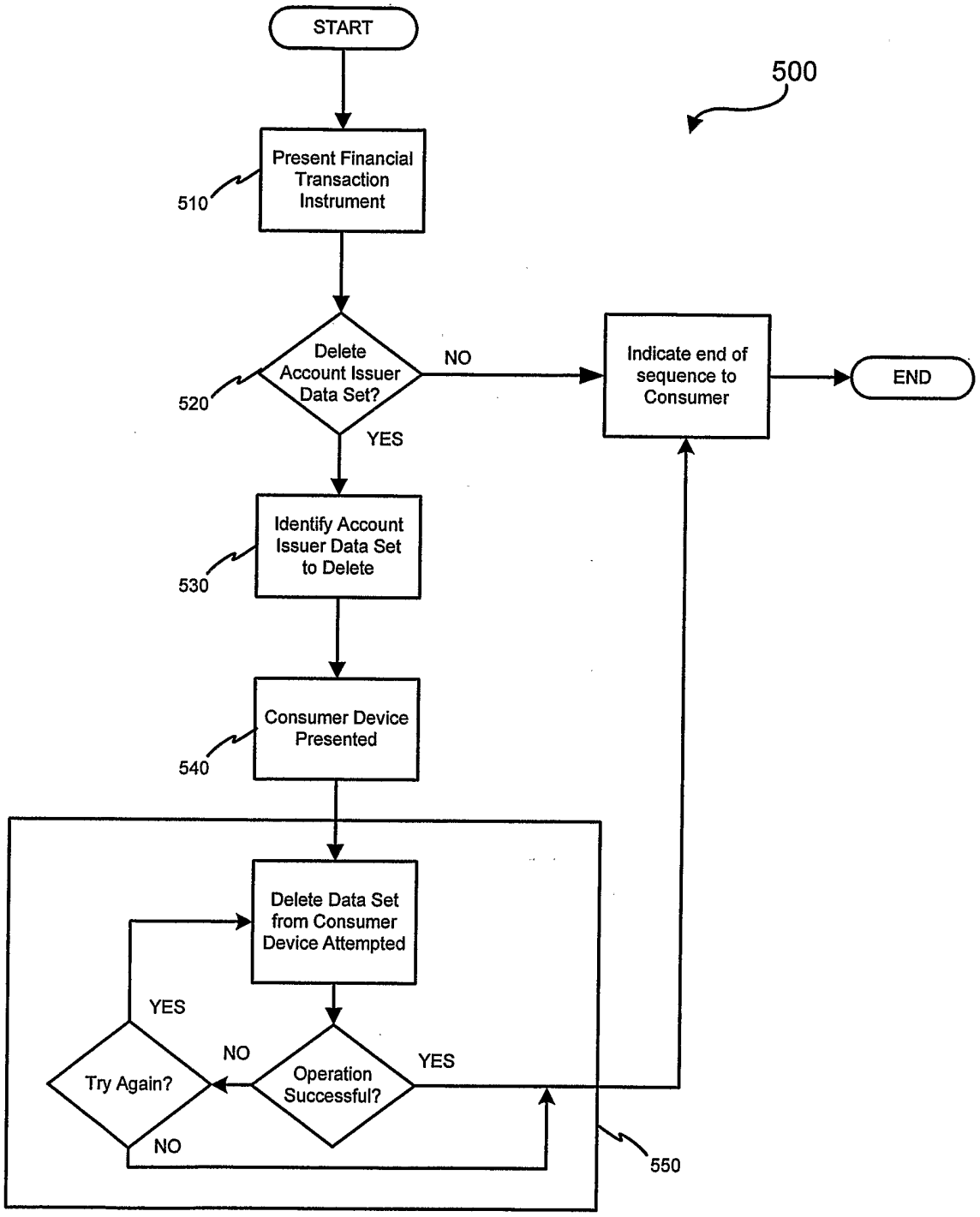
START
500
Present Financial Transaction Instrument
510
Delete Account Issuer Data Set?
520
NO
YES
Indicate end of sequence to Consumer
END
Identify Account Issuer Data Set to Delete
530
Consumer Device Presented
540
Delete Data Set from Consumer Device Attempted
YES
Try Again?
NO
Operation Successful?
YES
NO
550

FIG. 5

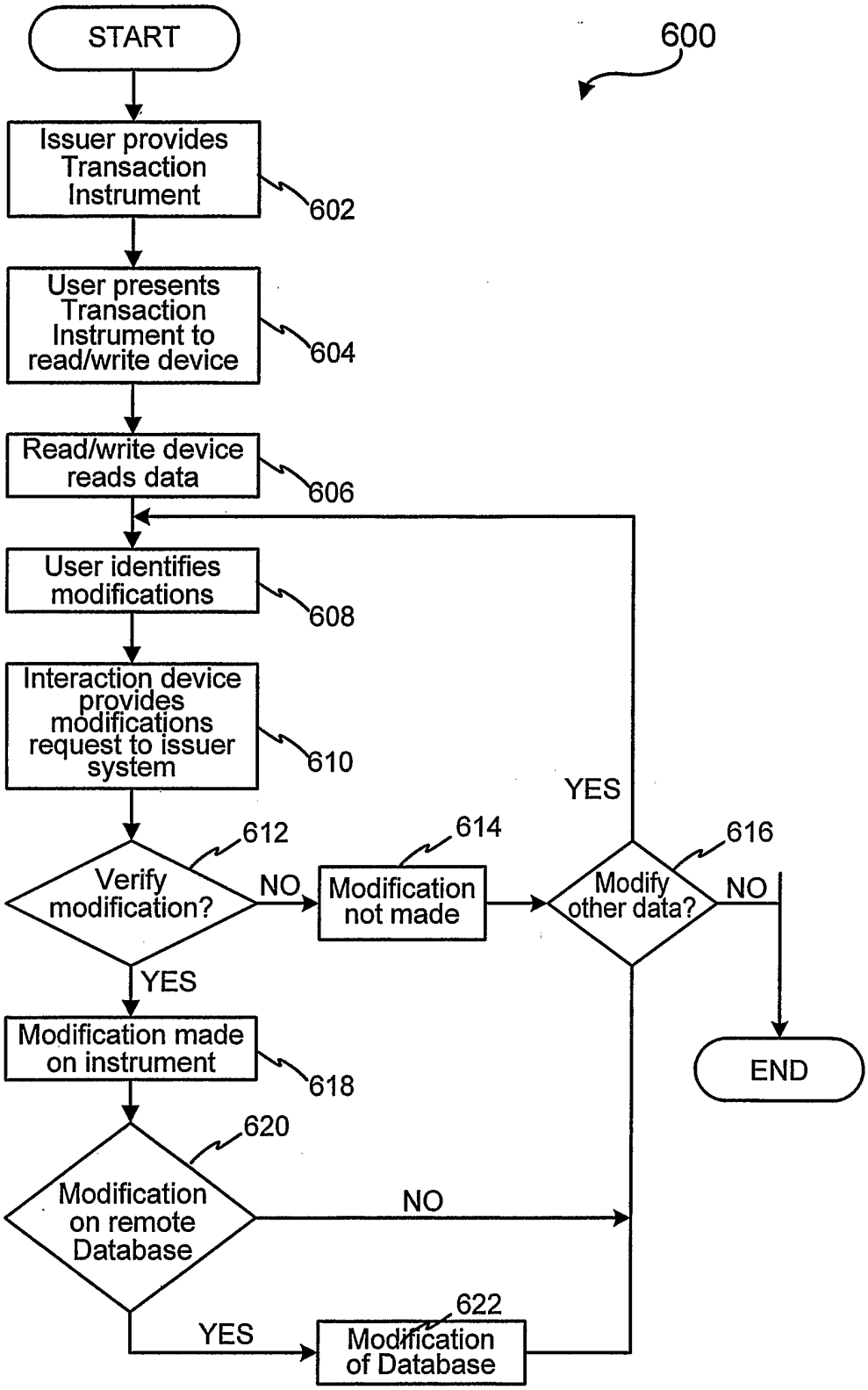
START
600
Issuer provides Transaction Instrument
602
User presents Transaction Instrument to read/write device
604
Read/write device reads data
606
User identifies modifications
608
Interaction device provides modifications request to issuer system
610
612
Verify modification?
NO
614
Modification not made
YES
616
Modify other data?
NO
END
YES
Modification made on instrument
618
620
Modification on remote Database
NO
YES
622
Modification of Database

FIG. 6

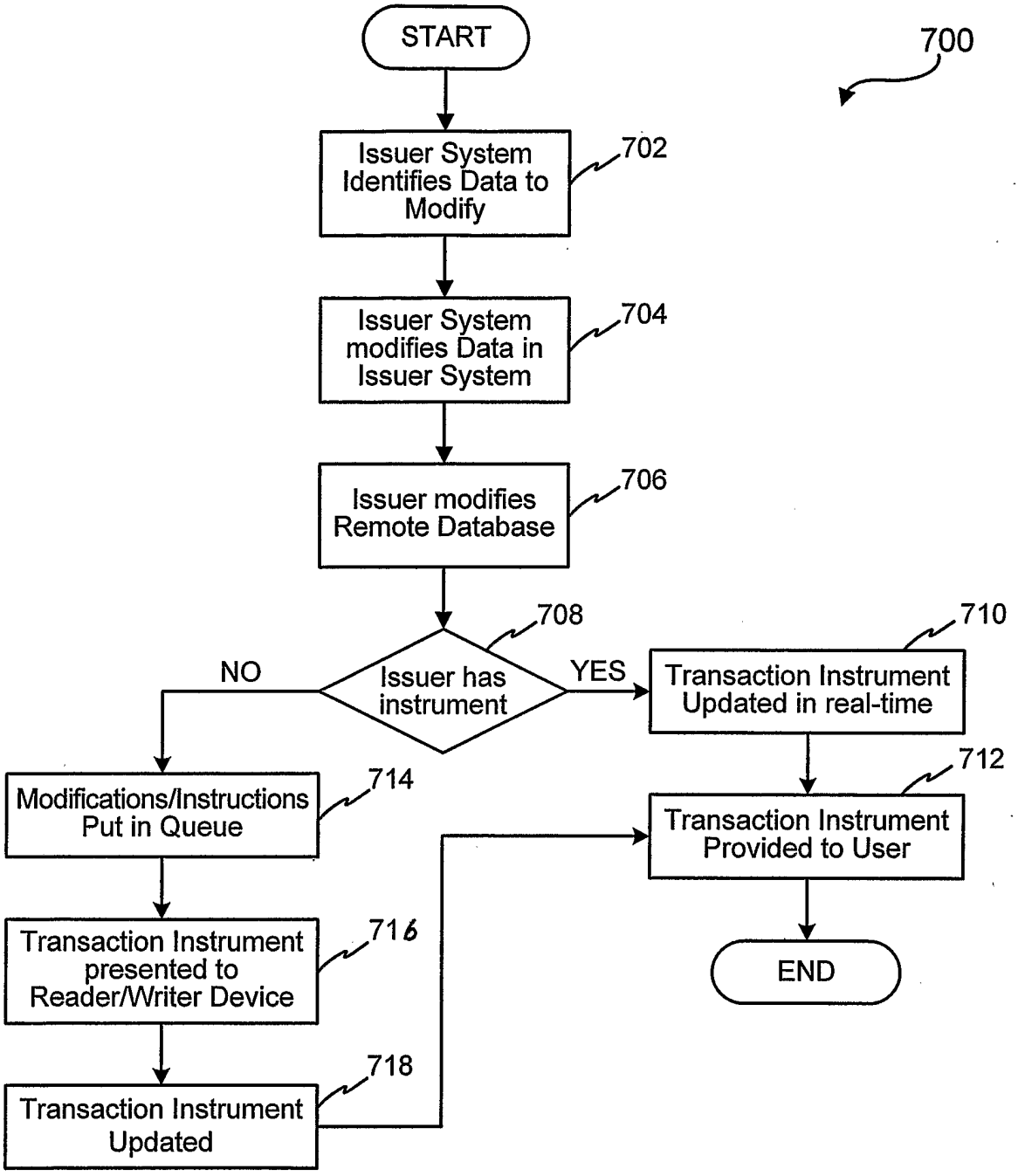
START
700
Issuer System Identifies Data to Modify
702
Issuer System modifies Data in Issuer System
704
Issuer modifies Remote Database
706
Issuer has instrument
708
NO
YES
Transaction Instrument Updated in real-time
710
Modifications/Instructions Put in Queue
714
Transaction Instrument Provided to User
712
Transaction Instrument presented to Reader/Writer Device
716
Transaction Instrument Updated
718
END

FIG. 7

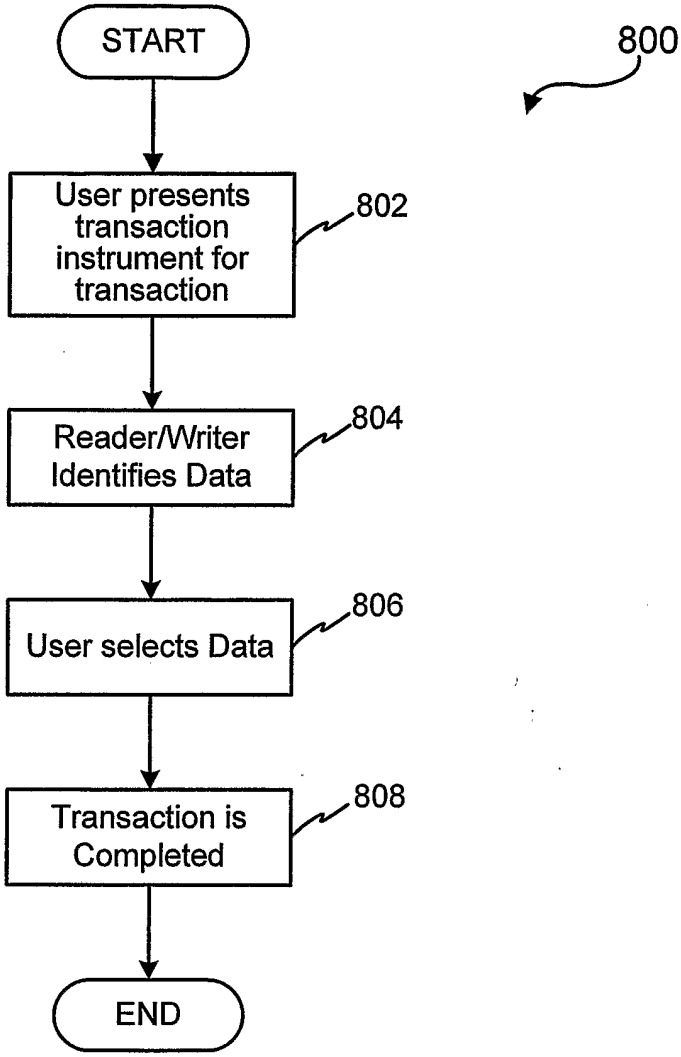
START
800
User presents transaction instrument for transaction
802
Reader/Writer Identifies Data
804
User selects Data
806
Transaction is Completed
808
END

FIG. 8