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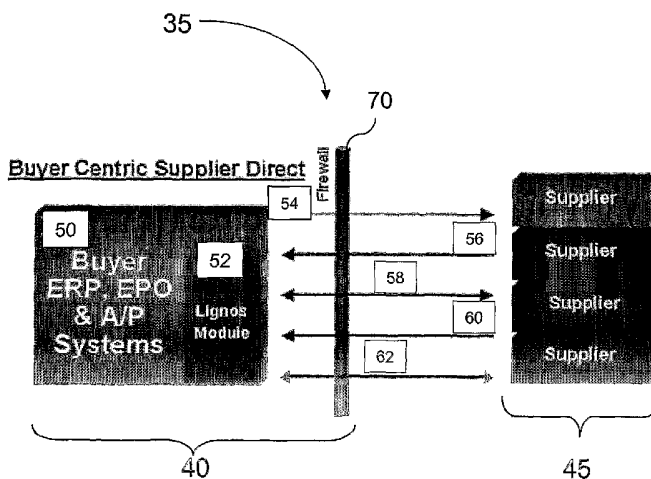
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(54) Title: ONLINE INVOICING AND PAYABLES INFORMATION DATABASE WITH A WEB INTERFACE



(57) Abstract: An online invoicing system that enables buyers and suppliers to exchange purchase orders and invoices electronically is disclosed. The system includes a buyer-side hosted web application architecture that can be accessed by suppliers. The online invoicing system is designed to provide for secure and paperless transactions between buyers and sellers.

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ONLINE INVOICING AND PAYABLES INFORMATION DATABASE
WITH A WEB INTERFACE

PRIORITY CLAIM

This application claims priority from a commonly owned, copending United States Provisional Patent Application – Serial No. 60/462,362, filed 11 April 2003, the disclosure of which is hereby incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to an online invoicing system. More particularly, the present invention relates to a paperless online invoicing system that provides for secure transactions between a buyer and a supplier.

BACKGROUND OF THE INVENTION

In existing buyer/supplier transactions, most invoices for ordering items take printed form. Even in situations where a buyer orders through an online web interface, the invoices are usually printed by the supplier and sent to the buyer.

Current solutions offer e-invoicing as a buyer hosted environment that is more

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conducive to sending electronic messages from a buyer's application to a supplier's application. In the application-to-application solution methodology each message requires integration on either side of the transaction – requiring a not insignificant investment in technology by the supplier – which when factoring the different types of messaging applications available and the number of different messaging standards, can be extremely high in integration, technology, and maintenance costs. Given that many organizations that have over 100 employees can have suppliers numbering in the hundreds, integrating with each and every supplier for each message set supported (Purchase Order, Acknowledgement, Change Order and Acknowledgment, Advance Shipping Notice, and Invoice) can create an administrative nightmare in addition to an exponential increase in complexity. Generally the entity size, Information Technology cost and sophistication – as it relates to use of technology – are significant hindrances to supplier participation in application-to-application e-invoicing initiatives.

Another approach involves the placement of an entity acting as an application service provider (ASP) intermediary or third-party facilitator between the buying organization and their supplier base. This option can offer a leveraged tool or on-ramp to the supply base that decreases the degree of technical cost and sophistication required. However, these platforms need to be extremely robust in information technology architecture and are significant in cost to build and maintain. In addition the complexity of getting a buyer's and supplier's information on a third party platform and the cost on both sides to implement, maintain and use result in barriers to adoption. Adding other factors like “distrust” of the third party, latency in message delivery, legal issues (with taking ownership of the Purchase Order) and financial viability of the service provider further impact adoption and acceptance.

Each of the above methods represents in their own right a supplier adoption challenge, which increases relative to the number of transactions between that supplier and their customer/buyer. Specifically, the less number of transactions occurring between each party the less business justification for utilizing any of the previously mentioned methods. This adoption challenge undermines any opportunity for both parties to derive cost benefits and efficiency gains.

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Online invoicing is not the same as Electronic Data Interchange (EDI). EDI solutions provide infrastructure for delivering transaction messages from one application to another usually between buyer and supplier. With respect to invoices the EDI solution would assume that the supplier/invoicer's fulfillment system would communicate electronically with the buying/paying organization Enterprise Resource System (ERP) system. This assumption may not be entirely accurate and numerous adjustments to the supplier's and buyer's systems may be required for proper operation.

It is an object of the present invention to provide an online invoicing system that overcomes the drawbacks and problems associated with buyer/supplier invoicing. It is a particular object of certain examples to provide an online invoicing system that provides for a secure connection between the supplier and buyer and provides for paperless invoicing.

SUMMARY OF THE INVENTION

In accordance with a first aspect, an online invoicing system with a web interface is provided. The invoicing system is hosted behind a buyer organization's firewall. In certain examples, the online invoicing system includes a transaction messaging database, a web server, a net appliance or an HTML interface, and one or more algorithms or software programs that integrates or aids in integration of the buyer's enterprise resource system (ERP), e-procurement, and/or accounting software systems. The transaction messaging database is configured to provide and route various messages to the appropriate department and/or party, e.g. the buyer, supplier, accounts receivable, accounts payable, etc. The web server is adapted to act as the interface between the buyer organization's server and the seller's server. Suitable web servers will be readily selected by the person of ordinary skill in the art, given the benefit of this disclosure.

In accordance with another aspect, the net appliance or HTML interface of the invoicing system can be configured to allow a buyer to create and route purchase order

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messages and view purchase order acknowledgments and invoice messages. Such capabilities allow the buyer to confirm almost immediately that the order has been received and also provide an invoice for accounts payable. The net appliance or HTML interface of the invoicing system can also be configured to allow suppliers to view purchase order messages, purchase order change order messages, and create and route purchase order acknowledgment and invoice messages. Such capabilities allow the seller to respond rapidly to changes in purchase orders and to provide electronic invoices to speed payment by the buyer. The net appliance or HTML interface of the invoicing system may be further configured to allow suppliers to view payment status information on their invoices. Other possible exemplary messages that the online invoicing software may generate are discussed below.

In accordance with another aspect, a method of online invoicing is provided. The method comprises providing a buyer computer comprising an online invoicing system, the online invoicing system comprising a transaction messaging database, a web server, a net appliance or an HTML interface, and one or more algorithms or software programs, sending one or more transaction messages to a supplier's computer, and generating an electronic invoice corresponding to the transaction messages sent to the supplier computer. In certain examples, the method further comprises sending a message acknowledging receipt of the purchase order message from the supplier's computer to the buyer's computer. In other examples, the method further comprises sending an advanced shipping notice message from the supplier computer to the buyer computer. In yet other examples, the method further comprises sending a request from supplier computer to the buyer computer to verify payment status. Other exemplary messages and requests are discussed below.

It is a significant advantage that the online invoicing system disclosed here provides for ordering, invoicing and status inquiries. Robust online invoicing systems can be designed to provide for paperless ordering, invoicing and status inquiries to reduce system complexity and overhead costs and to facilitate rapid exchange of orders between buyers and sellers.

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BRIEF DESCRIPTION OF THE FIGURES

Certain examples of the invention are described below with reference to the accompanying drawings in which:

FIG. 1 is an illustration of the conceptual architecture of an online invoicing system, in accordance with certain examples;

FIG. 2 is an example of an e-invoicing web application, in accordance with certain examples;

FIG. 3 is an example of a middle-ware layer, in accordance with certain examples;

FIG. 4 is an example of an Enterprise Resource Planning (ERP)-Accounts Payable (A/P) System in accordance with certain examples;

FIG. 5 is an example of a logical architecture of an online invoicing system, in accordance with certain examples; and

FIGS. 6-8 show depictions of an exemplary data flow model, in accordance with certain examples.

DETAILED DESCRIPTION OF THE INVENTION

It will be recognized by the person of ordinary skill in the art that the online invoicing system disclosed here provides an improved system for transactions between buyers and suppliers. Using the online invoicing system disclosed here, paperless transactions can be conducted and rapid invoicing and billing can be accomplished to provide easier and faster completion of transactions. Examples of the online invoicing system disclosed below are physically hosted within the firewall of the buying/paying organization. Such architecture is unique and distinguishes the

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online invoicing system as a more reliable and secure online invoicing system with a low cost of ownership and use.

In accordance with certain examples, the online invoicing system disclosed here may be configured to be a buyer centric supplier direct model that eliminates paper invoices received from suppliers. Such a paperless system reduces the costs to an organization by reducing the number of invoices processed. The online invoicing system can be integrated with existing systems with minimal costs to buyers and suppliers. The online invoicing systems disclosed here provide for electronic transmission of invoices. Electronic invoicing connects the buyer's procurement organization, the supplier organization(s), and the buyer's accounts payable department. These connections allow buyers to achieve the benefits of increased e-procurement and accounts payable efficiencies. The online invoicing system disclosed here overcomes drawbacks e.g. use of a third party platform to provide communication between buyers and suppliers, of existing invoice systems.

In accordance with certain examples, an online invoicing system with a web interface is disclosed. In certain examples, this system is hosted behind the buying organization's firewall. The buyer's supplier base uses the invoicing system's online web interface to electronically view purchase orders (POs)/ Change Order (CO) Requests, and generate and return Acknowledgements (Ack) and Invoice messages. The online invoicing system may be used by any size supplier. The PO information may be extracted from the buyer's procurement system and delivered to the supplier online by a web browser interface such as, for example, Internet Explorer or Netscape Navigator, and using suitable protocols, e.g. http, ftp, etc. Once an Acknowledgement and Invoice are received into the invoicing database, the Ack and Invoice can be automatically inserted into the buying organization's e-procurement, Enterprise Resource Planning (ERP), and/or accounts payable systems. Payables status (Disputed conditions of goods or purchases) information may then be periodically downloaded from these systems into the invoicing database, for viewing and resolution by suppliers.

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In accordance with certain other examples, an online invoicing system comprises a transaction messaging database, a web server, a net appliance and a software toolkit or database. The net appliance may be numerous electronic devices including but not limited to a personal computer, a personal digital assistant (PDA), a cell phone, etc. The net appliance includes a user interface that allows buyers and sellers to access the various functions of the online invoicing system. For example, the interface may allow buyers to create and route PO messages and PO change order messages, and view PO Acknowledgement and Invoice messages. The interface may also be configured to allow suppliers to view PO messages and PO change order messages, and create and route PO Acknowledgement and Invoice messages. The interface may also be configured to allow suppliers to view payment status information on their invoices, and to allow suppliers to resolve buyer issues with disputed purchase transactions. The online invoicing system can leverage off of workflow management and item-matching features already provided by the buyer's existing ERP or e-procurement software. If the buyer does not use, or does not have, this automated functionality in place, the online invoicing system may leverage off and enhance the buyer's existing manual workflow procedures. The online invoicing system can be designed to interact with boundary business processes that kick-off manual or automated workflow associated with invoice management.

In accordance with certain examples, the online invoicing system does not require an electronic interface with the supplier/invoicer's back-end systems. Suppliers can use the invoicing system manually and submit transaction messages over a secure Internet connection to the invoicing system within the buying/paying organization's firewall.

In accordance with other examples, the online invoicing system can be designed to optimize the operational productivity of corporate accounts payable departments. The invoicing system may be configured in numerous ways depending on the needs of the buyer. For example, the invoicing system may be physically hosted within the enterprise boundary of the buyer or invoice payer. Such an arrangement can provide fluid integration with the buyer's enterprise resource

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planning (ERP) system or Accounts Payable (A/P) system. The invoicing system can also be configured to enable buying/paying organizations to deliver an electronic Purchase Order (PO) or Change Order Request to their suppliers/invoicers over an online interface to a networked appliance. The invoicing system can further be configured to enable suppliers/invoicers to return a Purchase Order Acknowledgement, Change Order Acknowledgement, Advance Shipping Notice or electronic Invoice back to the buyer over an online interface. Such functionalities aid buying/paying organizations in responding quicker to avoid and resolve disputes arising from improper document handling, quality receipt, and other issues resulting in buyer's retention of the supplier's payment.

In accordance with certain other examples, the online invoicing system's message sets (Purchase Order, Acknowledgement, etc.) enable the buyer's in-place systems (ERP, e-procurement (EPO), A/P) to electronically match documents of record to make certain that items requested for purchase from the suppliers match what was shipped and ultimately billed by the supplier. Using the invoicing system disclosed here, buyers/invoice payers and suppliers can share payment and dispute status information in a secure manner over an online interface. In addition, the final invoice sent to the buyer can be constructed by the supplier/invoicing organization and is based off the information from the final revision of the purchase order. This ensures that the final invoice has a high efficiency for matching the Purchase Order when it is delivered to the paying organizations back-end system.

In accordance with certain examples, the online invoicing system includes a secure web interface to the supplier/invoicer organization allowing fulfillment resources to manually review and exchange numerous transaction messages with the buying/paying organization. Exemplary transaction messages include, but are not limited to, Purchase Order (PO), Purchase Order Acknowledgement (ACK), Change Order Request (CR), Change Order Request Acknowledgment (CRACK), Advanced Shipping Notice (ASN), Invoice, Dispute Resolution Request (DR), Dispute Resolution Acknowledgement (DRACK) and other messages necessary for transactions between a buyer and a supplier. The data model of each of the transaction

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messages is extensible and configurable through the use of programming languages such as, for example, Extensible Markup Language (XML) architecture principles. XML technology, or other suitable languages, allows the online invoicing system to be customized for the buying/paying organization back-end systems.

In accordance with certain other examples, the online invoicing system may be based on a web-enabled n-tier application architecture. The architecture is built on standard web server, database and integration platforms with XML as the foundation for data transfer between these physical application tiers. In certain examples, the application consists of the following logical application tiers: Presentation & User Interface (Web), Business Logic, Data Persistence, Transaction Management, and Integration. In certain examples, the Presentation & User Interface (UI) is rendered by the web server platform as a presentation language (e.g. WML, HTML) to the user's "web browser" (e.g., on a networked appliance). The UI components of the invoicing system can be configured to handle Hyper Text Transfer Protocol (HTTP) or like requests and responses. When a request comes in the main UI component will determine the necessary action to build a response. Data may be received in XML format from the business logic, transaction management or data persistence tiers of the application. XML Style Sheet Transformation (XSLT) may be used in these UI components to transform the XML to HTML, which is sent to the user's browser. Standardized XML schemas for each transaction message serve as series of contracts setting the formatting rules for how data is handled by the UI tier. Examples of the Business Logic are contained within application components, which reside on what is often called the "middle-tier." The Business Logic provides business rules associated with invoice matching and vendor management. The Data Persistence tier is based on a standard Open Database Connectivity (ODBC) database server platform. Data is stored in the Database Management System (DBMS) in relational form and mapped to XML schemas as necessary so that data can be read and manipulated by other application components. The Transaction Management tier consists of a series of software components that interact with the UI and Integration tier to handle the challenge of long-running transactions. The Integration tier consists of a series of XML schemas and software interfaces flexibly exposed for integration with back-end

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enterprise systems. As mentioned earlier these interfaces can be used to connect the invoicing system to various integration technologies. XML is the standard for data formatting. Several options are available for data transfer or communication protocol, such as hypertext transfer protocol (HTTP), File Transfer Protocol (FTP), Microsoft Message Queue (MSMQ) and Transmission Control Protocol (TCP).

In accordance with certain examples, the online invoicing system can rely upon a reliable middle-ware tier to handle data validation, mapping and workflow management. This middle-ware tier can be packaged as part of the online-invoicing system or can be purchased separately through third-party vendors.

In accordance with certain examples, the online invoicing system disclosed here provides a buyer centric model in which the supplier can communicate with the buyer through a secure connection, e.g. through a firewall. More particularly, certain examples of a buyer centric model are configured to provide a secure connection. Referring now to FIG. 1, an example of a buyer centric model is disclosed. Buyer centric model 35 includes buyer enterprise resource planning (ERP), e-procurement (EPO) and accounts payable (A/P) systems 50 and a software module 52 on the buyer side 40 of buyer centric model 35. Buyer centric model 35 enhances existing buyer systems using existing workflow and matching features. Software module 52 includes one or more databases and/or servers that are configured as a transaction messaging database and/or a web server. Supplier side 45 and buyer side 40 communicate with each other through firewall 70 located on buyer side 40. Purchase order 54 can be delivered from buyer side 40 to supplier side 45. Supplier side 56 acknowledges receipt of purchase order 54 and sends status on order fulfillment to buyer side 40. Buyer side 40 is also configured to send a change request 58. Buyer side 40 is also configured to send an acknowledgment process including sending a change request receipt in the event the buyer changes the terms on the purchase order or cancels the purchase order. Supplier side 45 is configured to create an invoice 60 and submit the invoice electronically into accounts payable of the buyer. Supplier side 45 is configured to check on payment status of invoice 62 by accessing suitable databases on buyer side 40. In accordance with certain examples, an example of an online

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invoicing web application 100 that may be configured on the buyer side is shown in FIG. 2. Invoicing web application 100 comprises purchase order transaction web pages 102, invoice/advance shipping notice web pages 104 and supplier administration web pages 106. Each of web pages 102, 104 and 106 is processed using business logic software 110 and a web database 120. The invoicing web application is configured so that it can be accessed by the supplier and the buyer.

In accordance with certain examples, an example of a middleware layer is shown in FIG. 3. Middleware layer 200 communicates with the online invoicing web application 100 (see FIG. 2). Middleware layer 200 includes data mapping/validation 210, workflow/transaction management 220 and API/ODBC/MSMQC integration. The middleware layer is configured to integrate the web application and the buyer enterprise resource planning systems.

In accordance with certain examples, an example of a buyers' enterprise resource planning (ERP) system-accounts payable (A/P) system is shown in FIG. 4. ERP-A/P system 300 is configured to receive, send and route messages and information to and from middleware layer 200. For example, purchase order 302 can be received from online invoicing system 100, routed through middleware layer 200 and sent using various protocols, such as file transfer protocol (FTP), MSMQ, or ODBC, to purchase order transactions database 320. Similarly, purchase order acknowledgment 304 can be received from a supplier computer and routed to purchase order transactions database 320. Also, purchase order change request messages 306 can be routed to purchase order transactions database 320 to have a record of the changes to the purchase order. ERP-A/P system 300 may also be configured to receive invoices 308 and advanced shipping notices 310, each of which can be routed to an accounts payable database 330. Supplier profile 312 may be stored in a supplier master database 340, which contains information including supplier names, addresses, goods received, etc.

In accordance with certain examples, an example of a logical architecture of the online invoicing system is shown in FIG. 5. The online invoicing system includes

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a remote computer 410 with an internet browser, such as Internet Explorer or Netscape Navigator. Remote computer 410 communicates with web server 430 through a suitable protocol, such as hypertext transfer protocol (http), or through a virtual private network (VPN) 420. Web server 430 can be positioned in a demilitarized network so that it can receive messages from remote computer 410. Web server 430 can then pass the messages through ODBC 430 to a database server 450 located behind a secure corporate network. The corporate network is typically made secure using a firewall or by limiting access to the network only to certain users or groups of users, e.g. based on IP or MAC address. The secure corporate network includes a database server 450, an integration server 460 in communication with an ERP-A/P 480 through one or more suitable interfaces, connections or protocols, such as application program interface (API)/Open Database Connectivity (ODBC)/Microsoft Message Queue (MSMQ)/file transfer protocol (FTP) 470.

In accordance with certain other examples, FIGS. 6-8 are depictions of data flow models in one example of the online invoicing system disclosed here. Referring to FIG. 6, purchase order 602 is issued 604 from a buyer computer (not shown) and received by the supplier/vendor 606. Supplier/vendor 606 acknowledges receipt of the purchase order 612 by sending a message back to the purchase order transactions database 616 on the buyer system. In the event that buyer sends a change request 608 or 614 to change the order, supplier/vendor 606 can send an acknowledgment that the purchase order has been modified. In addition, the purchase order change requests can be reconciled 610 to ensure that duplicate orders are not placed. Referring now to FIG. 7, once a purchase order is received by the supplier/vendor 606, supplier/vendor 606 can send an invoice 640 to the buyer so that the supplier/vendor can receive payment as soon as possible. The buyer can also receive advanced shipping notice 620 from the supplier/vendor 606. Supplier/vendor 606 can also send a message to the buyer computer. Both the invoice 640 and the advance shipping notice 620 received by the buyer can be forwarded to accounts payable 630 such that the buyer can be paid, e.g. by check, electronic wire transfer, etc.

In accordance with additional examples and referring to FIG. 8, a journal 650

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can be kept of the transactions between a buyer and a seller. The journal can be sent to or accessed by supplier/vendor 606. The journal may also keep a record of whether or not an invoice has been paid 660. The invoicing system may also include a supplier master list 680 with administrative profiles 670 to provide a database that includes supplier information, e.g., supplier names, bank accounts for sending payment, etc. The system may also use include data flow to facilitate paperless transactions between buyers and suppliers.

Although the present invention has been described in terms of certain examples, other examples, alterations, modifications and substitutions will be recognized by the person of ordinary skill in the art, given the benefit of this disclosure.

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CLAIMS

1. An online invoicing system for paperless invoicing, the system comprising:
 - a transaction messaging database;
 - a web server;
 - a net appliance; and
 - one or more software programs configured to provide integration of the transaction messaging database, the web server, and the net appliance.
2. The online invoicing system of claim 1 in which the transaction messaging database is configured to provide and/or route messages.
3. The online invoicing system of claim 1 in which the web server is configured as an interface between a buyer's computer and a seller's computer.
4. The online invoicing system of claim 1 in which the net appliance is a personal digital assistant, a cell phone, or a personal computer.
5. The online invoicing system of claim 1 in which the net appliance is configured to allow a buyer to create and route purchase order messages and view purchase order acknowledgments and invoice messages.
6. The online invoicing system of claim 1 in which the net appliance is configured to allow a supplier to view purchase order messages, purchase order change order messages, and create and route purchase order acknowledgment and invoice messages.
7. The online invoicing system of claim 1 in which the net appliance is configured to allow suppliers to view payment status information on invoices.
8. The online invoicing system of claim 1 in which the one or more

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software programs further integrates a buyer's enterprise resource planning, e-procurement and/or accounting software systems.

9. The online invoicing system of claim 1 in which the one or more software programs is a database.

10. An online invoicing system for paperless invoicing, the system comprising:

a transaction messaging database;

a web server;

an HTML interface; and

one or more software programs configured to provide integration of the transaction messaging database, the web server, and the HTML interface.

11. The online invoicing system of claim 10 in which the transaction messaging database is configured to provide and/or route messages.

12. The online invoicing system of claim 10 in which the web server is configured as an interface between a buyer's computer and a seller's computer.

13. The online invoicing system of claim 10 in which the HTML interface is configured to allow a buyer to create and route purchase order messages and view purchase order acknowledgments and invoice messages.

14. The online invoicing system of claim 10 in which the HTML interface is configured to allow a supplier to view purchase order messages, purchase order change order messages, and create and route purchase order acknowledgment and invoice messages.

15. The online invoicing system of claim 10 in which the HTML interface is configured to allow suppliers to view payment status information on invoices.

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16. The online invoicing system of claim 10 in which the one or more software programs further integrates a buyer's enterprise resource planning, e-procurement and/or accounting software systems.

17. The online invoicing system of claim 10 in which the one or more software programs is a database.

18. A method of providing paperless online invoicing, the method comprising:

providing a buyer computer comprising an online invoicing system, the online invoicing system comprising a transaction messaging database, a web server, a net appliance or an HTML interface, and one or more algorithms or software programs configured to provide integration of the transaction messaging database, the web server, and the net appliance or HTML interface;

sending one or more transaction messages from the buyer computer to a supplier computer;

generating an electronic invoice corresponding to the transaction messages sent to the supplier computer.

19. The method of claim 18 in which the transaction message is a purchase order message.

20. The method of claim 19 further comprising sending from the supplier's computer to the buyer's computer a message acknowledging receipt of the purchase order message

21. The method of claim 18 further comprising sending an advanced shipping notice message from the supplier computer to the buyer computer.

22. The method of claim 18 further comprising sending a request from supplier computer to the buyer computer to verify payment status.

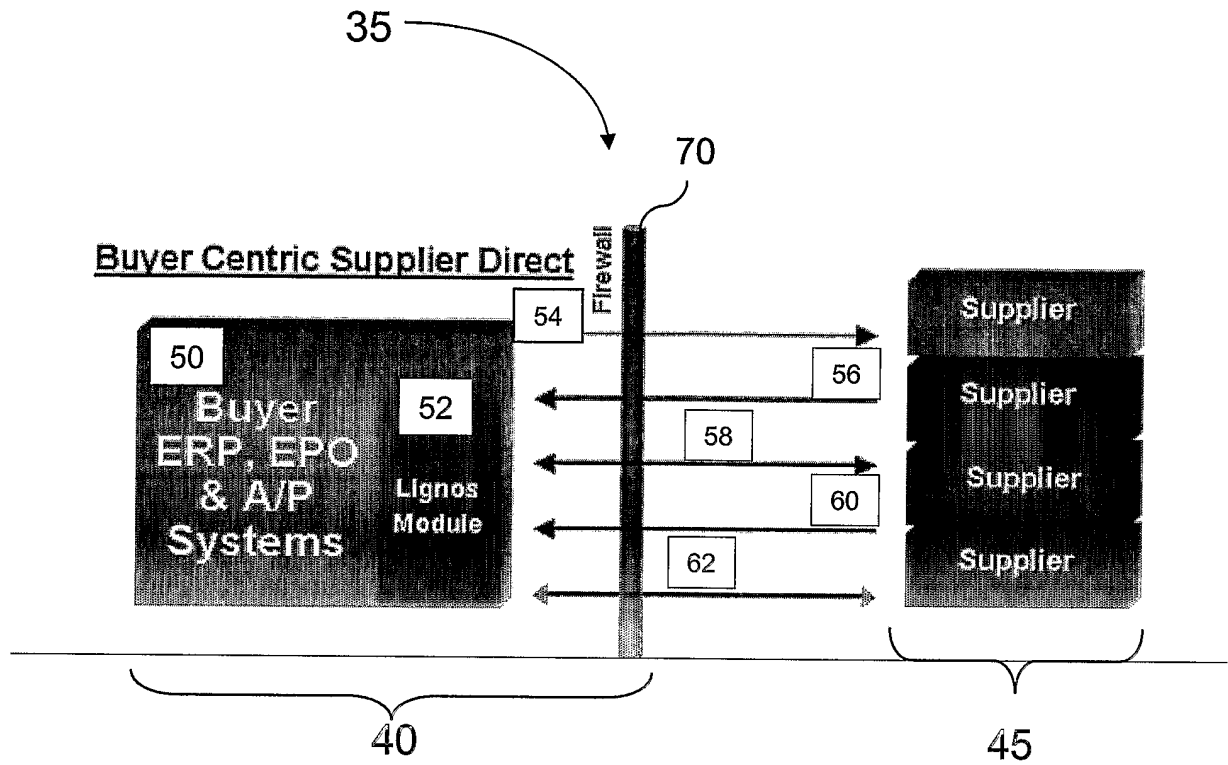


FIG. 1

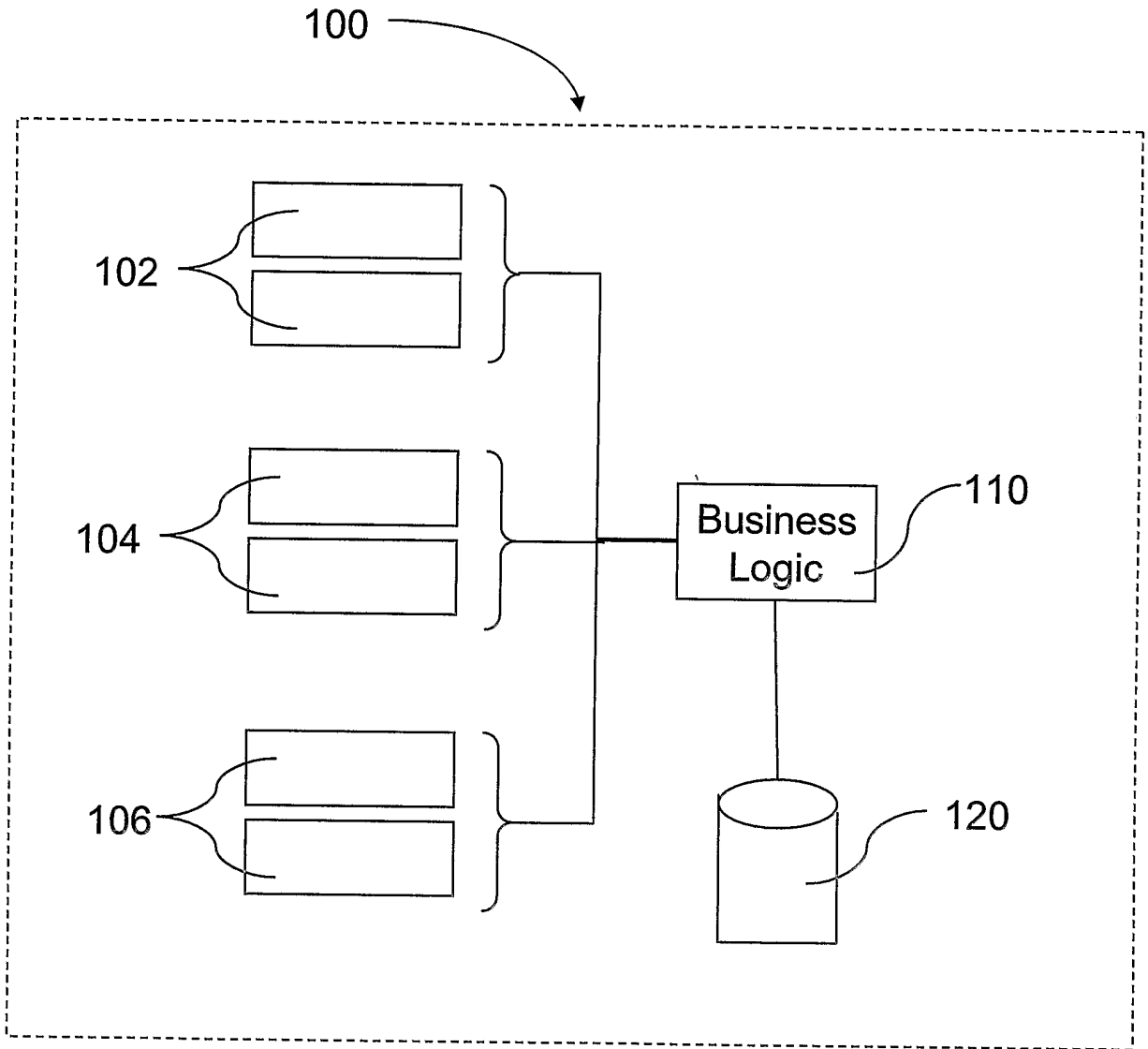


FIG. 2

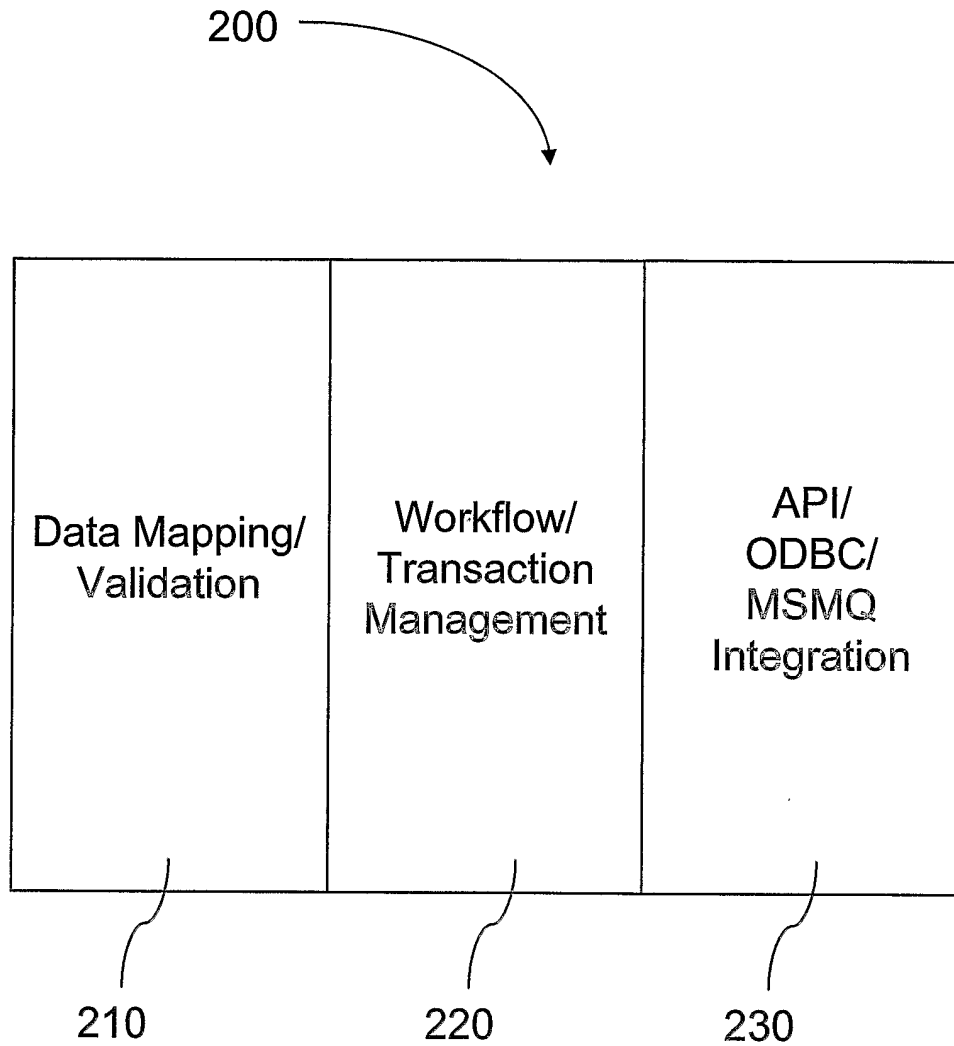


FIG. 3

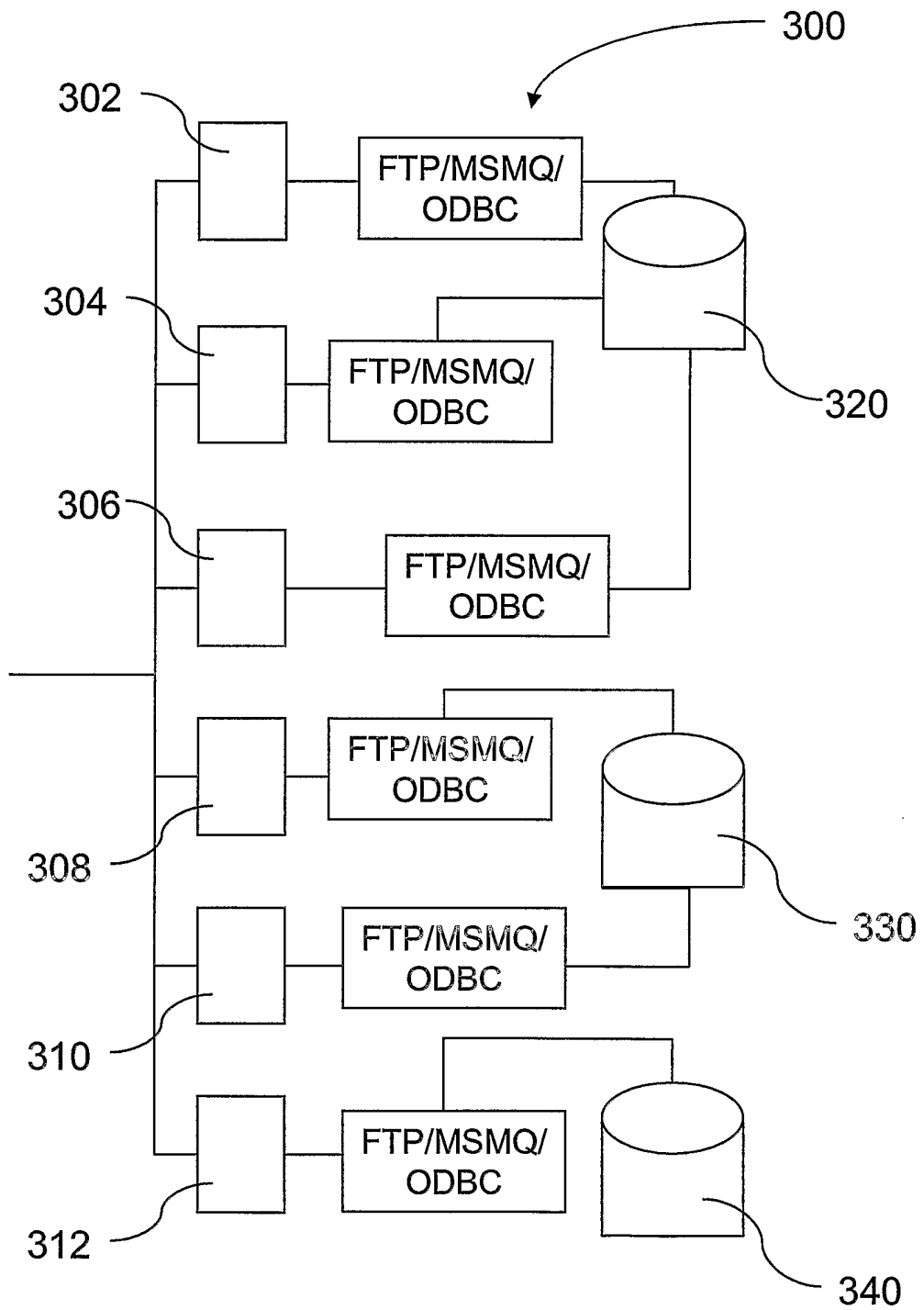


FIG. 4

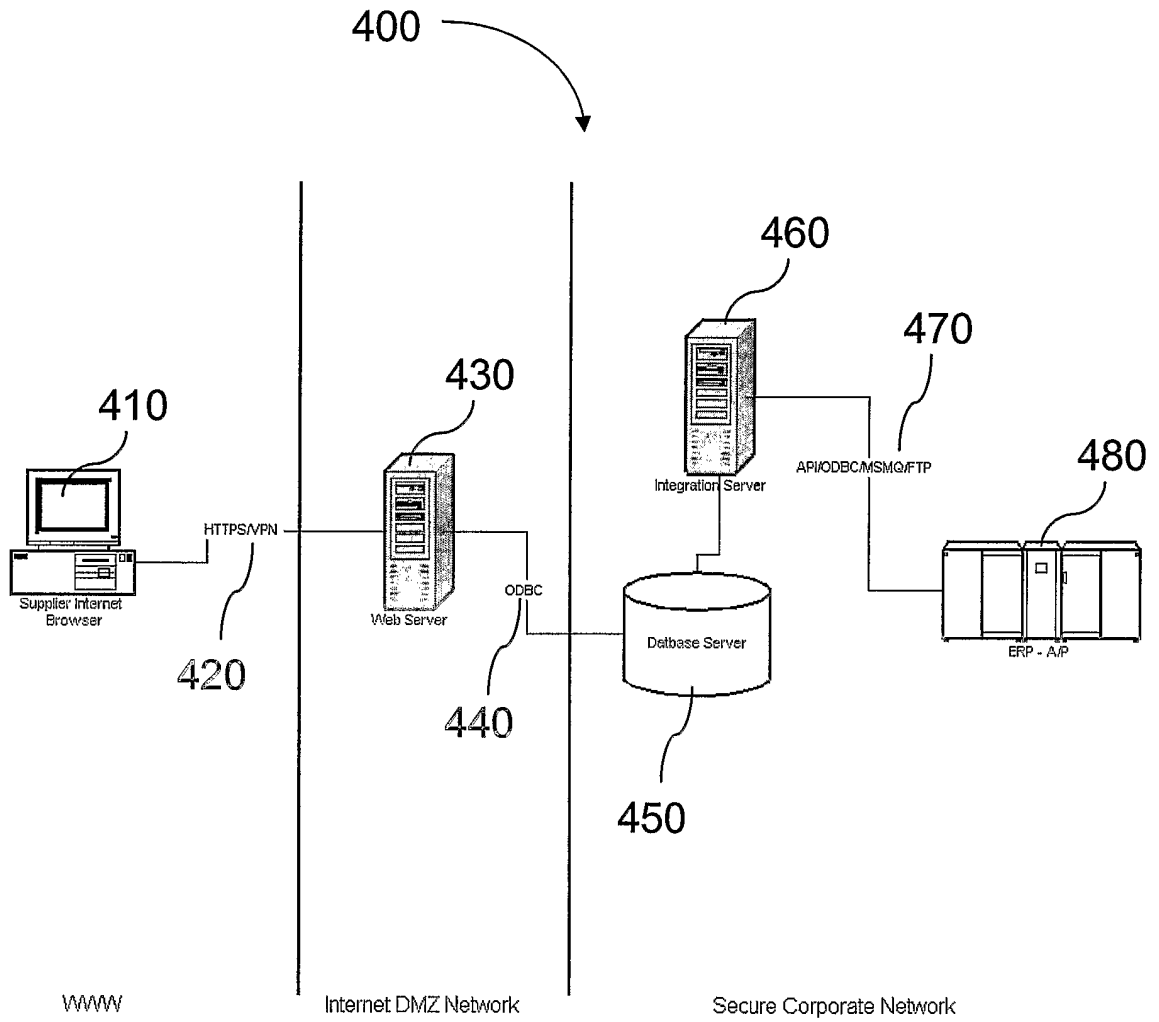


FIG. 5

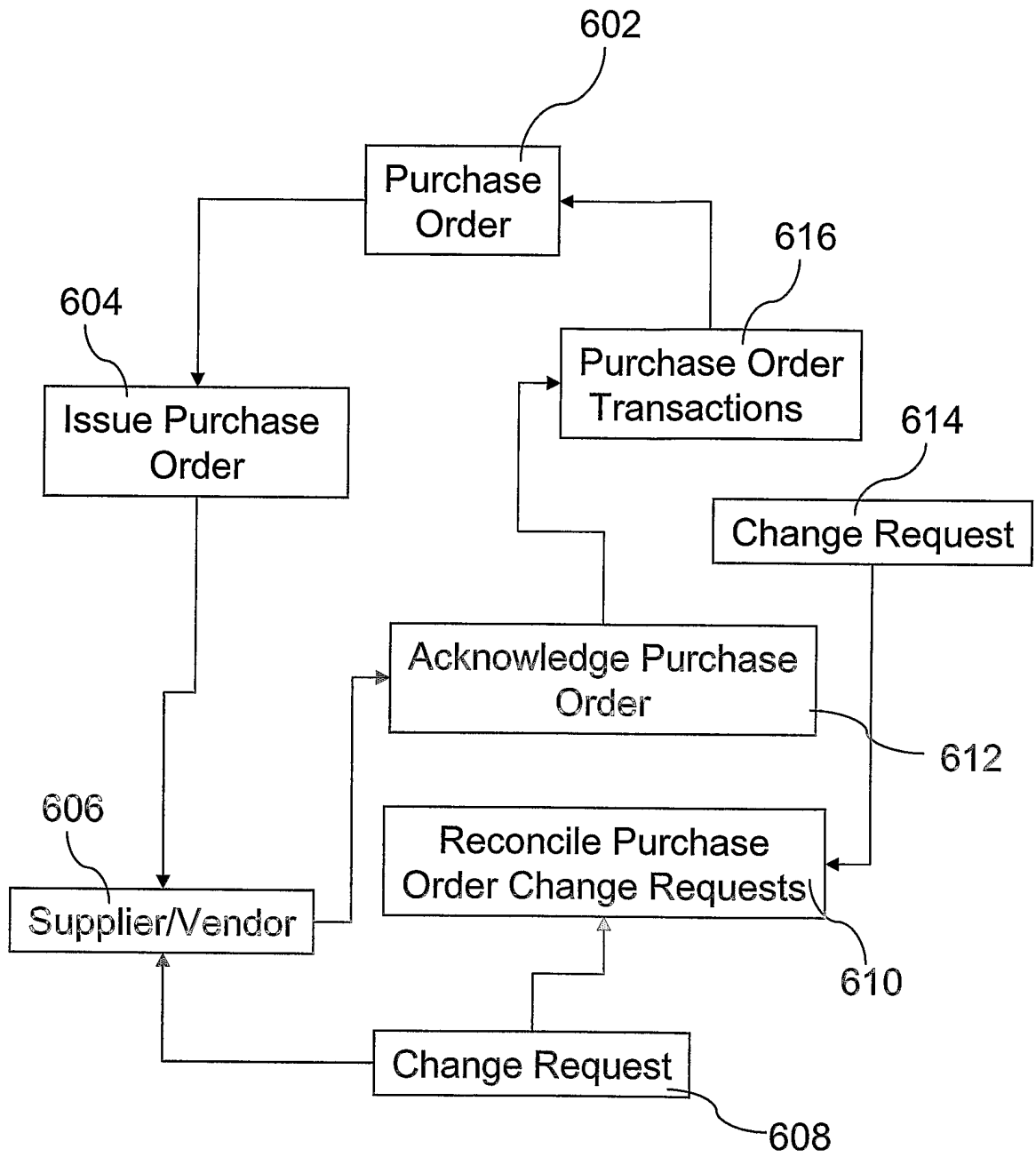


FIG. 6

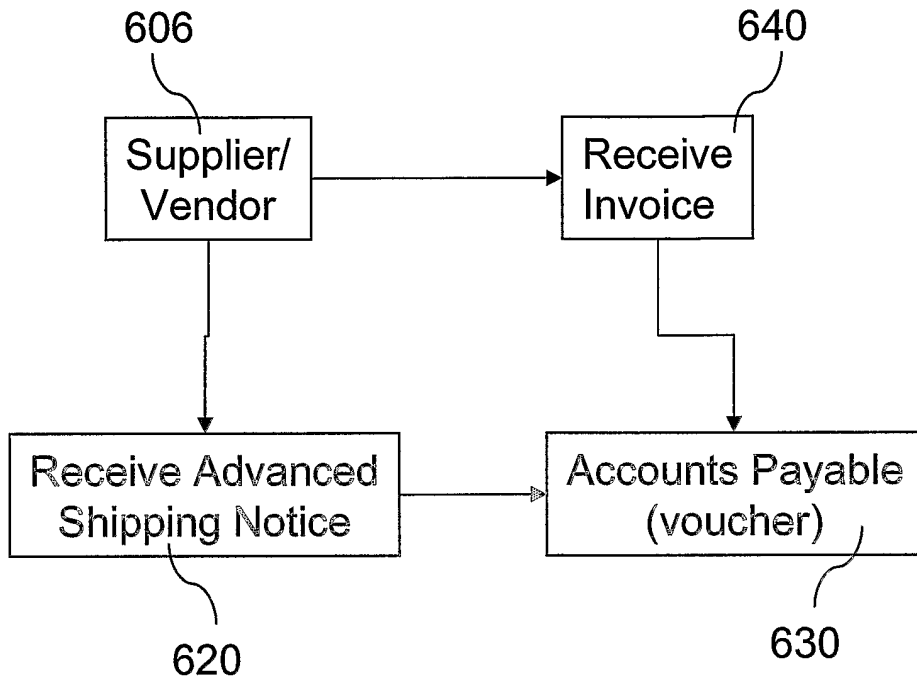


FIG. 7

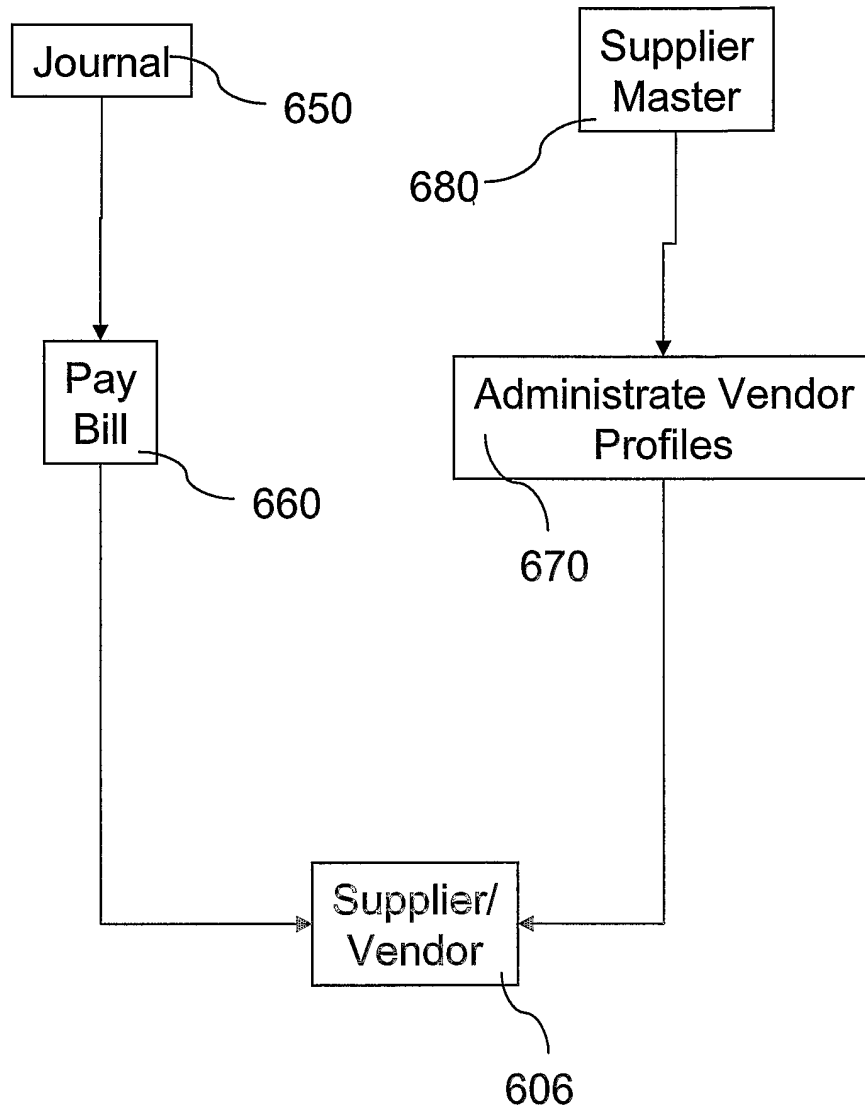


FIG. 8