Title: SYSTEM AND METHOD FOR WEB-BASED ELECTRONIC BUYING SYSTEM

Abstract: A buying system including an integrator computer system in communication with one or more supplier computer systems. The integrator computer system may maintain customer profile information in the form of both company and requisitioner profiles. The integrator computer system may accept a customer requisition for a desired product that a customer creates using a variety of methodologies. The system uses the customer profile information to obtain, from a supplier computer system, real-time product information responsive to the customer requisition. The real-time product information preferably includes product pricing, availability, promise, date, expiration date, and/or inventory lot number. The customer requisition methodologies may include a rapid order form, a template, a hot list, a catalog browsing feature, a catalog search feature, or a web requisition form ("WebReq") that allows a requisitioner to input a non-catalog product request in free-form.
SYSTEM AND METHOD FOR WEB-BASED ELECTRONIC BUYING SYSTEM

FIELD OF THE INVENTION

The present invention generally relates to systems and methods for electronic buying and more specifically relates to systems and methods for buying products from a variety of suppliers via a central web site.

BACKGROUND OF THE INVENTION

Goods across various topical areas have been sold in a traditional fashion. Traditionally, a manufacturer of a good would post a price and sell a good to a consumer via the telephone or in person. As some companies began to specialize in manufacturing, other companies, called distributors, would gather together various products from different vendors and sell these goods to the public. Collectively, these manufacturers and distributors are known as suppliers.

As the complexity of business grew, and the number of customers and available products increased, computers and associated databases began to be used to keep track of certain business information. These host computers (which were traditionally mainframes) could be accessed by various other computers and supplier personnel to identify customers, determine pricing and/or availability, or perform other data-intensive tasks. Some suppliers even used other specialized computer equipment to perform targeted acts, such as hosting the content for a product catalog on a database or catalog server.
With the advent of widespread use of the Internet, the landscape of commerce has changed again. Now, many suppliers (and other entities) have sold their wares via web pages over the Internet. Many suppliers now use separate web servers to store program code for these new web sites, and these web servers may also be able to connect to and communicate with the traditional company host computers. Therefore, a complete supplier system may have a traditional selling site, a host computer, a database server, and/or a web server.

These supplier web sites focus on offering for sale and providing information about the goods that are manufactured or distributed by that particular supplier. They replace the telephone order process with a World Wide Web-based ordering mechanism.

Additionally, one or more entities (aggregators) may combine and list the products from the catalogs (inventory) of several different suppliers. These aggregators may have their own host computers and/or web servers that communicate with the computer systems of various distributors or manufacturers. Heretofore, these entities have been little more than catalog content aggregators, and without real-time linkage or interaction with the supplier computer systems. The catalog aggregator sites merely present the various catalog items to the user in a way that may be more efficient than having the user browse through all of these catalogs separately. Catalog aggregator sites typically did not provide dynamic pricing or availability check.
SUMMARY OF THE INVENTION

The present invention contemplates, in at least one presently preferred embodiment, a web-based buying system including an integrator computer system. The integrator computer system may maintain customer profile information and business logic rules. The integrator computer system may receive a product requisition for a desired product from a customer and obtain real-time product information provide by a supplier relating to the desired product. The supplier computer system may be located in a geographically or otherwise remote location from the supplier computer system.

The integrator system preferably exists as either a completely separate entity from its one or more suppliers, or the system may be part or all of one "preferred" supplier's computer system. The real-time product information obtained from the supplier may include product pricing information, availability status, promise date (expected delivery date), expiration date, inventory lot number, or some other information.

The customer may preferably create a requisition for a desired product using a web-based interface to the integrator system. The requisition methodologies may include a rapid order form, a template, a hot list, a catalog browsing feature, a catalog search feature, or a web requisition form ("WebReq™") that allows a user to input a non-catalog product request in free-form. A WebReq request may be satisfied by a human operator of the integrator system.

The present invention may also include a variety of other features and devices for use with the web-based buying system. These and other details, objects,
and advantages of the present invention will be more readily apparent from the following description of the presently preferred embodiments.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention and its presently preferred embodiments will be better understood by reference to the detailed disclosure hereinafter and to the accompanying drawings, wherein:

**Figure 1** is a schematic diagram of an electronic buying system in which the integrator computer system is separate from the supplier computer systems;

**Figure 2** is a schematic diagram of an electronic buying system in which the integrator system is at least partially hosted by a supplier computer system;

**Figure 3** is a schematic diagram of an electronic buying system in which the integrator is affiliated with one of its suppliers;

**Figure 4** shows a web page site map for an integrator-based buying system;

**Figure 5** shows a sample table of integrator system registration information;

**Figure 6** shows a rapid order form for use with the present invention;

**Figure 7** shows an order template for use with the present invention;

**Figure 8** shows a hot list for use with the present invention;
Figure 9 shows sample search results for a "Class A Volumetric Flask" search;

Figure 10 shows sample catalog drill down results with a preferred supplier's products shown first; and

Figure 11 shows a partially full shopping cart for use with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The integrator system of the present invention can be used in any industry where a variety of manufacturers and/or distributors provide related products (e.g., a common genre of products). The following detailed description provides various embodiments of an integrator system used to provide scientific products (e.g., beakers, flasks, chemicals, etc.). Nothing in the following description should limit the scope of this patent to any group of products or any particular industry. The scientific product references are provided by way of example only.

The beginning of this portion of the specification gives a general outline of the structure and computer hardware of several preferred embodiments of an integrator-based buying system according to the present invention. The focus is on the interaction between the integrator and the supplier computers during a customer requisition. This discussion is followed by a more detailed description of these interactions coupled with the specific web functionality used in at least one presently preferred embodiment of the invention. This portion of the specification concludes
with several examples of the integrator-based buying system in practice to aid in clarity.

**FIG. 1** is a schematic diagram of an electronic buying system according to a presently preferred embodiment of the invention. **FIG. 1** shows an integrator Iₐ associated with two primary manufacturers M₇ and M₉, two primary distributors D₇ and D₉, and several third party manufacturers M₈, M₉, and M₉. The integrator performs a more interactive service with its primary suppliers than aggregators have performed with their suppliers in the past. The integrator may combine and integrate some or all of the products available from one or more suppliers into single or multiple catalogs of products to be sold to consumers. An integrator may be a content integrator or a purchase integrator. While a supplier (manufacturer or distributor) or aggregator web site may focus its content on the products that it supplies, the integrator site, will preferably treat all of the suppliers on a more equal basis and will provide all suppliers with similar opportunities to take advantage of the site.

Preferably, integrator Iₐ has a close buying and data-transfer relationship with each of the four primary suppliers M₇, M₉, D₇, and D₉. This close relationship may allow the integrator to gather content information about the primary suppliers' products and may allow the integrator access to "real-time" product information (including product pricing, availability, promise dates, product expiration dates, lot numbers, etc.) from the primary supplier sites' host computers and/or database servers. The primary distributors, in turn, may have close buying and data-transfer relationships with one or more additional manufacturers (illustrated as vendors V₇, V₉, and V₉).
For the purposes of this specification and the claims, the terms "real-time interaction" or "real-time access" are characterized by a short period of time between a request for information and the corresponding response to that request. Real-time does not necessarily mean "instantaneously" or "simultaneously." Rather, a real-time response (or real-time information) is distinguished from a system that sends information according to some predefined time frame or schedule (rather than responding to a recently received request). A regular communication or dumping of predefined information will be referred to herein as a "batch" or "batching" that information. A batch (as used herein) does not occur in direct response to a "real-time" request for information.

Other third party suppliers $M_K$, $M_L$, $M_M$ are suppliers that have a "looser" or less interactive relationship with integrator $I_A$. This relationship may include a regular buying or data-transfer relationship between the integrator and these third party suppliers. This relationship preferably exists to the extent necessary so that when a customer of the integrator's system makes a requisition for a product manufactured by a third party, the integrator is able to contact that particular third party and obtain the requested product for its customer.

As shown in FIG. 1, the integrator site and each of the four primary suppliers preferably have a web server $WS_A$, $WS_B$, $WS_C$, $WS_P$, $WS_G$ (or an information server connected to the integrator's server, or some combination) for communicating with other entities over the Internet. Additional web servers may be added at sites to increase capacity and load handling. Dedicated lines for Internet protocol communications (e.g., Virtual Private Networks) may also be used. Also, the integrator and each of the primary suppliers preferably include a host computer.
HC_A, HC_B, HC_C, HC_p, HC_G containing certain account and/or product information and a database server DS_A, DS_B, DS_C, DS_p, DS_G containing catalog content (product information) and customer profile information. The third party manufacturers M_k, M_l, M_m and the vendors V_x, V_y, V_z preferably include a host computer HC_k, HC_l, HC_m, HC_x, HC_y, HC_z but may or may not include a database server, or a web server allowing these sites to directly connect to the Internet.

More specifically, the host computer (for any of these entities) preferably includes the financial and account-based information about its customers. This account information may include billing and/or shipping addresses, pricing logic to determine a specific customer’s price for each product, and an order history that allows a customer to view all orders charged against a chosen account.

The database server preferably includes catalog content that describes the available products in great detail. There may be a link to an image of the product, each associated with a web server. A supplier database server preferably includes detailed information about the products that it supplies, and the integrator database server preferably contains detailed information about products supplied by all suppliers to the integrator site.

The database server, DS_A, may also include various customer profile information. The integrator system may keep both a "company profile" that determines high-level decisions about the customer, institution, or other buying entity and various requisitioner profiles that include information controlling each requisitioner’s use of the integrator buying system. These profiles are preferably linked to the account information on the host computer. Specifically, a company (or university, organization, etc.) may have one or more accounts with one or more
suppliers (of the integrator), and each requisitioner for the company may be assigned certain usage rights for one or more of these accounts. The database server may also contain a set of business logic or business rules that define various aspects or limitations about a requisitioner's use of the system as described below. This logic may utilize both account information (typically stored on the host computer) and profile information (typically stored on the database server) to determine these aspects or limitations.

The web server, \( \text{WS}_\lambda \), may preferably perform most other tasks that are performed by the system. For example, the web server may contain the web pages utilized by the system, images of the products available for order, static web page content, and all of the underlying web functionality (e.g., Java scripts, XML, etc.).

Registering with the integrator system typically entails creating both a company profile and usually one or more requisitioner (user) profiles. These profiles are used by the system, in combination with certain business logic, to determine how the integrator system will interact with each specific company and/or requisitioner. The company profile typically involves inputting administrative, billing, and other addresses and information into the system via various data fields.

The company profile also allows the addition or modification of these fields as "customer-specific data." Customer-specific data is a way for a company (or subsets of that company) to tailor the use of the integrator system to their particular needs. For example, assume that the "company" is a university with both a biology and a chemistry department. This university's accounting system may prefer to use sequential purchase order (PO) numbers, but a repetitive departmental charge number for each purchase. Even though the integrator system may use a PO number field to
track different purchases internally, the deployment of the integrator's system for the university would define the additional field to track the departmental charge number.

The customer-specific data may also be used to limit certain requisitioners to the use of a particular account or credit card, to certain spending limits or approval requirements, and/or to the viewing of certain catalogs. Typically, the various account numbers that the company maintains with the integrator system and with the various suppliers are input into the company profile, and these accounts are linked or assigned or available to different requisitioners. When a requisitioner attempts to order a product, the integrator system will follow the company profile and integrator system business logic to ask the requisitioner to enter an account number (or select from a list provided by the system). This customer-specific data not only allows the company to track more information and control its requisitioners, but the integrator system may also validate the information input by a requisitioner against the allowable choices as found in the company profile.

Each user of the integrator system from or supporting a certain company preferably also has his or her own requisitioner profile. This requisitioner profile preferably includes information about that specific user and provides acceptable data choices for some or all of the company-defined customer-specific data fields. For example, if the university defined a "grant number" customer-specific data field, a particular requisitioner's profile may list the two grant numbers under which the requisitioner (perhaps a graduate student) is currently working. If this requisitioner tried to input a different grant number when making a requisition, the integrator system will preferably not allow the request to go forward (data validation). The use of the data found in the company or requisitioner profile is governed by the
business logic found preferably on the database server $\text{DS}_A$. The grant number
customer-specific data field could also be used by a university employee to track all
of the requisitions and orders placed for each grant number to make sure that the grant
funds were not exceeded. The integrator business logic may even be used to prevent
such spending automatically if the integrator system controls or receives data on the
balance of each grant.

In one presently preferred embodiment of the invention, the integrator
site exists completely separate from all of its underlying suppliers (as shown in FIG. 1). The integrator site preferably includes a web server $\text{WS}_A$ that is capable of
transmitting information over the Internet. This "web-based" communication may
occur over the publicly accessed Internet, a private internet or intranet, or some
combination of public and/or private web-based communication channels. Generally
speaking, various requisitioners ($R_i$ to $R_n$) preferably access the integrator system
from a remote location through a personal computer or some other web-capable
device (e.g., a handheld or palmtop computer, personal digital assistant, or web-
capable pager). The customer (requisitioner) typically enters the integrator web site's
Uniform Resource Locator (URL) into the customer's web browser. The integrator
site may provide catalog content and functionality across all relevant suppliers. The
integrator may also provide the "real-time" functionality to communicate with the
supplier computer systems to get updated information about product availability,
pricing, and other information.

Generally speaking, when customers use the integrator site, they log
onto the site and access their requisitioner profile information. If the customer is
given access to more than one account number, he/she may select which account number to use at this time. The customer may later change to a different account.

If the requisitioner desires a particular product, a search (or some other requisitioning methodology) may be initiated against all or selected catalog content files in the integrator database server $DS_A$. The relevant product information may be assembled at the integrator web server $WS_A$ from various information residing in the integrator’s host computer $HC_A$. To the extent that additional information may be required about a located item, or to the extent it becomes necessary to extend the search to other suppliers, the integrator web server $WS_A$ may communicate (via XML, OBI, frames, hyperlinking, EDI, etc.) over the Internet or some other electronic communication link with one or more of its closely-linked suppliers. Data about a vendor product (e.g., $V_x$’s product), for example, may be assembled by the distributor’s web server $WS_{p}$ from information contained in the distributor's database server $DS_p$, host computer $HC_p$, and/or the distributor's interface with the vendor's host computer $HC_x$.

At various stages in the selection of products and the building and approval of orders, information may be "pulled" from the relevant source computer about price, availability, etc. Depending upon the integrator $I_A$ account number selected by (and available to) the requisitioner $R$, price for the buying company may be based entirely upon information stored in the integrator’s host computer $HC_A$. This may be the list price or integrator cost, or some calculated price based on this information in the host computer, $HC_A$. These or other pricing may be batched to the integrator site at regular intervals from the supplier's computer. For some customers, however, the business arrangement may be such that the integrator $I_A$ passes on the
pricing which the customer has negotiated with a major supplier \( M_b \), \( D_p \), \( D_g \) or \( M_c \) or even a third party supplier \( M_k \), \( M_l \) or \( M_m \). The business logic resident in the integrator's host computer \( HC_A \) or database server \( DS_A \) may recognize such relationships and preferably would then pass to the relevant source (e.g., manufacturer host computer \( HC_B \) via web servers \( WS_A \) and \( WS_B \) or directly via EDI) a request for quote on the desired item.

In order that the manufacturer host computer (e.g., \( HC_B \)) may correctly price the item, integrator \( I_A \) preferably should have a table that associates a particular supplier \( M_b \) account number for that customer with an integrator \( I_A \) account number for that customer. This association table may reside either on host computer \( HC_A \), database server \( DS_A \) (as part of the company profile), web server \( WS_A \) or elsewhere. The integrator account number may be found in the requisitioner \( R \)'s profile stored on the integrator database server (and selected by requisitioner \( R \), if he/she is authorized to use multiple account numbers).

If the integrator business logic indicates that the product price may be provided real-time by the supplier, the integrator may "query" the supplier host computer and request the correct contract pricing (as well as updated availability status and/or promise dates). This integrator request is preferably accompanied with the customer's supplier account number so that the supplier host computer will be able to look up the correct pricing algorithm or table for this customer. Once the price is calculated, this pricing information is preferably sent back to the integrator site (via the web server \( WS_A \) by XML, EDI, OBI, etc.) where the customer can now view the pricing information. As described herein, such a price inquiry may be a background query, not obvious to the requisitioner.
Real-time communication occurs between the integrator computer system and one or more supplier computer systems in several ways, including EDI between host computers and various XML or OBI transmissions between web computers. There are two types of communications used to collect information at the integrator computer system from various supplier computer systems, involving communications between their respective web computers, which can be described as queries and responses to queries. The first type is a "foreground query" (often called "punch-out"); the second type is a "background query." Typically, the integrator computer system and one or more supplier computer systems are coordinated to communicate and exchange information in a variety of forms of foreground queries, background queries and other one-way and two-way communication formats. Both foreground and background queries may be enabled with the use of XML or OBI scripts or some other form of electronic interaction.

When the integrator computer system initiates a foreground query or punches-out, it communicates with a supplier computer system, and the requisitioner is presented with the web presentation, navigation, and some functionality of that supplier site. Session information or border presentation (as with framing technologies) from the integrator computer remains in effect and (usually) visible to the requisitioner. The requisitioner, however, will typically also be presented with a "sub-screen" or window to the supplier's site. With such a foreground query, the requisitioner typically is aware that he or she is at the supplier's site (albeit through the integrator computer). Supplier sites may have their own "look and feel." In preferred forms of the invention, a session is initiated on the supplier's site using
information transmitted from the integrator web computer, including various identifying data.

Alternatively, and for other data transfers, the integrator computer system "background query" requests and obtains information from a supplier computer system "in the background," i.e., where the customer remains on the integrator computer and the access to the supplier computer typically is not obvious. With the background query, the integrator computer system (typically the integrator web server) retrieves the relevant data from the supplier site and presents it to the requisitioner on the integrator computer. As a result, the "look and feel" does not change for the requisitioner. In addition, the integrator computer system may format or reformat the retrieved data as desired, e.g., to adapt the data retrieved from one or more supplier sites to the look and feel presented by the integrator web server.

One example of a punch-out may occur if a requisitioner wishes to search a supplier site for a specific product. Upon request, the integrator computer preferably opens a frame (based on common HTML coding practices), an overlay, or some other web page device to show the requisitioner a second web page without "leaving" the integrator system. The integrator computer preferably communicates with the selected supplier computer system (via XML, OBI, EDI, etc.) and passes to the supplier a request for information, information identifying the current session on the integrator computer, and relevant account details (account number, ship-to zip code, etc.) which are derived directly or indirectly from the requisitioner's individual profile or from the overall company profile. Navigating the supplier site, the requisitioner may modify the request or seek other information before selecting an item and requesting it be added to his or her shopping cart. The supplier computer
then processes the request and sends real-time product information (or other data) back to the integrator system. If the requisitioner selects that supplier’s product for inclusion in the shopping cart, it is used to build an order line (specifying the desired quantity and unit of measure) on the integrator’s site which can subsequently be accepted by the requisitioner and (after any required other approvals) turned into an order from the requisitioner’s company to the integrator and an order from the integrator to the respective supplier(s).

Product availability information may also be determined from information stored in integrator $I_A$’s host computer $HC_A$ (typically updated in a batch fashion from host computers $HC_B$, $HC_P$, $HC_G$ and $HC_C$, and possibly from $HC_K$, $HC_L$ and $HC_M$ or by linking to these computers). This batched availability information may be sent to the integrator’s host computer $HC_A$ daily or at some other regular interval (or on some other basis, i.e., special updates, etc.), and may include updated availability information as of the time of the batch. Such immediately accessible information about product availability may suffice during the product selection and requisition stages, but this periodically updated information may not be sufficiently current for the final determination of a delivery date at the time of ordering.

Before final order approval, the integrator site will preferably make a background query to the supplier host computer (directly or through the respective web server) for current availability status and promise date information. If manufacturers $M_B$ and $M_C$ ship nationally from one site, the background queries to host computers $HC_B$ and $HC_C$ may preferably be conducted under the integrator $I_A$’s account number (associated with the respective supplier). If distributors $D_P$ and $D_G$
maintain inventory at multiple sites, either the ship-to zip code or some other identifier (e.g., the distributor’s special account number for sales through integrator \( I_A \) for that customer) could be passed to host computers \( HC_F \) and \( HC_G \), respectively, in order to tap into the distributors’ sourcing logic and determine availability of the requested product in the requested quantity at a selected warehouse, for example. The data returned to the integrator web server \( WS_A \) may then include quantity available, location, and promised delivery date for one or more products.

This same “communicative” approach may be extended to products shipped directly from one of the distributor’s vendors (e.g., \( V_X \)) or one of the integrator’s third party suppliers (e.g., \( M_{\lambda} \)), at least with respect to availability information (including promise dates). Distributor host computer \( HC_F \) should preferably have current information as to products maintained in distributor \( D_F \)’s inventory (e.g., from \( V_Y \) and \( V_Z \)) and may also have reasonably current information about restocking shipments expected from the vendors \( V_Y \) and \( V_Z \) for those items that are currently out of stock. This real-time availability and re-stocking information may provide the integrator site the ability to calculate a reasonably accurate promise date for future shipment of the selected product. Information about product lot numbers and expiration dates may be queried and retrieved in a similar fashion.

The integrator-based buying system of the present invention does not have to exist as a completely separate site from all of the primary and third party suppliers. In another presently preferred embodiment of the present invention shown in FIG. 2, the integrator site \( I_A \) may include one or more integrator web servers \( WS_A \) (and an integrator database server, \( DS_A \)), but the integrator may not have its own host computer. Instead, the integrator site \( I_A \) may preferably be hosted (share space) on
one or more host computers \( HC_{AF} \), perhaps owned by one of its distributors (e.g.,
distributor \( D_p \)). Therefore, integrator \( I_A \) and distributor \( D_p \), for example, may each
have one or more web servers \( WS_A, WS_F \) (respectively) and an integrator database
server (\( DS_A, DS_F \), respectively) but share space on a single host computer \( HC_{AF} \). The
integrator’s interaction with distributor \( D_p \)’s products/pricing/availability may be
simplified because of this setup (no need to send queries over the Internet for real-
time information). In most other respects (including interfaces with suppliers \( M_B, D_G 
and \( M_C \) and third party manufacturers \( M_{IC}, M_I, \) and \( M_M \)), this scenario will be similar
to the embodiment described above, except that the distributor host computer \( HC_{AF} \)
will preferably now perform both pricing and availability on distributor \( D_p \)’s products.

With respect to the web functionality (as further described below) of
this embodiment, the integrator site may also "prefer" the products of its host
distributor \( D_p \). For example, the results of requisitioner searches for products may list
the host distributor’s \( D_p \)’s products at the top of the search results, ahead of other
suppliers’ products. On the other hand, the integrator system may still maintain its
logical independence from the distributor \( D_p \) and not favor that distributor’s products
at all, or permit different preferences based on the company profile, as discussed
below.

In another presently preferred embodiment of the invention (shown
schematically in FIG. 3), the integrator web system may actually be little more than a
supplier web site with third party interaction, \( WS_{AF} \). The integrator web server may
be linked to the supplier host computer (or mainframe) \( HC_{AF} \) and may have direct
access to that system. However, this integrator site may be different than a
conventional supplier web site because it also offers third party products. Information
about the third party products may be assembled by punching-out for information
from the third party’s host computer (via XML, frames, hyperlink, EDI, etc.). This
linked embodiment will preferably favor the linked supplier’s products by giving
these products a more prominent placement on the site and/or a fuller description.

The above examples generally describe the interaction between an
integrator site and the integrator site’s primary and secondary suppliers. The
customers (requisitioners) preferably access the integrator site via the World Wide
Web (the “web”) portion of the Internet or Virtual Private Networks. As such, much
of the functionality of the buying system stems from the web-based interface and
scripting at the integrator site. Therefore, various embodiments of the present
invention will now be described with respect to this web functionality. For the
purposes of this discussion, it is assumed that a product requisitioner has accessed the
integrator’s web site through a web browser on a computer or other Internet-capable
device that resides remote from the computers of the integrator computer system.

Upon accessing the integrator’s I_a’s web site via a web browser, the
customer may preferably be presented with a home page or other initial web page that
generally allows access to the various features of the integrator-based buying system.
A presently preferred embodiment of a site map showing the interaction of the
various web pages of the integrator-based buying system is presented in FIG. 4. The
home page of the system may provide a way for registered users to login and access
the buying system and a way for unregistered users to browse the various features of
the scientific product purchasing system to determine whether or not they wish to
become a full registered user of the site.

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A distinction should be made at this point between having an "account" and being "registered" with the integrator buying system. An account is set up (typically by a company) as a way to facilitate billing and to contract for pricing. Accounts may preferably be set up at the supplier level, the vendor level, the integrator level, or any combination thereof. Registration with the integrator site, on the other hand, entails creating company and requisitioner profiles on the integrator site, and identifying which supplier and integrator accounts can be used by which requisitioners.

In a preferred embodiment of the present invention, the integrator may want most customers to have an account with the integrator for pricing purposes. If no account exists, the system may access or set up a list price account for the user.

In a preferable revenue model, the integrator system determines price to the buying company (retail price) in the majority of cases. If a customer does not have any supplier accounts associated with his/her registration (e.g., no contract pricing with individual suppliers), and no overall discount arrangement with the integrator, the customer will typically be charged list price by the integrator system. Some suppliers may give the customer product availability information without an account, but no supplier-side discount pricing would be calculated.

Setting up a requisitioner profile is an individual process that may occur on-line. There may also be a batch registration that allows many requisitioners from or associated with the same company to be registered at one time. With batch registration, a spreadsheet or other data entry form is created and then uploaded to the integrator web server. The web server \( WS_A \) or database server \( DS_A \) parses this information and creates the new profiles.
The registration information will preferably remain on the integrator's database server \( \mathbf{DS}_A \) as part of the company and requisitioner profiles. At least one of the registration data fields lists the various account numbers to which the user has access. Whenever a request is made by the integrator web server to any supplier or other computer on behalf of a particular requisitioner, one of the requisitioner's account numbers will preferably be transferred along with the request. The account number often serves the added function of identifying where the order is to be shipped. The system suppliers may use the account numbers (or other destination indicator) to determine not only pricing, but also warehouse availability based on the account's ship-to location.

When registering on-line, the requisitioner is preferably presented with a registration web page that asks for information, such as the sample in FIG. 5. Preferably, there is an off-line registration process for both the company (creating a company profile) and an on-line requisition for each requisitioner (creating the various requisitioner profiles). The company profile information generally sets out high level account specifications and each requisitioner profile selects from the applicable choices (e.g., which accounts each requisitioner may use, how much each requisitioner may requisition or approve, etc.).

This registration information is preferably used by the system to create a profile of the customer (company or requisitioner). After the customer profile is created, selected information in the profile can be changed by the requisitioner, and selected other information may only be edited by an administrator of the integrator site or an authorized representative of the customer (such as spending limits). For a small company, the profile may be used for informational purposes only (no
decentralized control of spending). For a large company, certain customer-specific data may be configured in the company profile. This customer-specific data allows the integrator system to be tailored to each customer. A company may set up specific order approval rules (certain individuals can only approve expenditures up to a defined limit) or may require the entry of non-standard information (a release number instead of PO or a department number instead of charge number). This "unique" information is carried through the site as customer-specific data.

Customer-specific data may include additional registration information or product purchasing input fields (or changed fields) for a particular company. These additional fields may be optional or mandatory. For example, the integrator system may have a field where a PO number is input for each order, typically as a mandatory field. However, a certain company may have one PO number for all purchases made on the integrator system, but the company may distinguish each particular order with a release number to be input by the requisitioner. Here, a common example of customer-specific data may be to add a release number field to the company profile so that all requisitioners will have to input a release date (to accompany the pre-assigned PO number) upon requesting a product (if the release number was mandatory). Determining what fields are presented, who can edit these fields, and whether a particular field is required is a company-based decision reflected in the company profile that is then implemented for each requisitioner associated with that company profile.

After a requisitioner has registered with the system (and at any future visit to the site), the requisitioner may preferably be able to log into the integrator-based buying system and take full advantage of the features of the site. By clicking
with a mouse pointer or otherwise selecting to log into the system, the requisitioner is preferably presented with a login page. To log into the system, the requisitioner preferably need only enter the username and password that the requisitioner selected as part of the registration process (part of their requisitioner profile). After logging in, the customer's or requisitioner's profile preferably identifies the integrator account number and/or supplier account numbers that may be used to determine pricing/availability and other product information.

The company and requisitioner profiles on the integrator-based buying system are preferably hierarchical in nature. Each company register on the buying system may have registered one or more account administrators and approvers, and multiple requisitioners. The administrators may have the ability to control many aspects of the company/integrator relationship including the management of various requisitioners and their payment options. The approvers generally approve the requests for products made by the requisitioners, and the requisitioners (the lowest members of the hierarchy) preferably just request products. With this hierarchical structure, a department head or ordering manager may be able to control the purchases of many various employees (different scientists, faculty members, and/or students) while spending a reduced amount of time and energy in doing so. As used herein, a customer (as opposed to a supplier) of the integrator may be a requisitioner, an approver, an administrator, or any other entity on the buy-side of the system. Most customers are only requisitioners, but an approver or administrator may also be set up as a requisitioner.

Generally speaking, a requisitioner requests products, an approver approves the requisition for ordering, and an administrator manages the company
account. Through management of the customer-specific data, an account
administrator may place limits or guidelines on each specific requisitioner's account
access. For example, a requisitioner may only be able to order certain products, order
from a certain supplier, or use a certain credit card. Also, there may be spending
limits for each requisitioner for a particular order, for a particular account, or during a
particular timeframe. Specifically, a certain requisitioner may only be allowed to
create orders up to, for example, $500, or the requisitioner may be able to create a
request for products for any amount of money but can only approve an order for up to
$1000. For requests above $1000, for example, the next approver up the hierarchical
chain must approve the request before it will become an order. This approver may
also have an administrator-defined spending limit, and may need to get larger requests
for products approved by his/her approver or an account administrator. In practice,
using the university example, the requisitioner may be a graduate research student, the
approver may be his/her professor, and the further approver may be the department
head or purchasing manager for the university. The administrator may be a
designated employee in the university purchasing department or an authorized
integrator employee implementing the system for the university.

The integrator system may also preferably allow an administrator to
utilize rules for customer credit card use according to the present invention. Here, the
administrator can give a particular requisitioner no credit card privileges, privileges to
only use one particular credit card, privileges to select from a group of credit cards
when a purchase is made, or no restrictions on the editing and use of credit card
information. This credit card information page may also display the current credit
card and use privileges for the current requisitioner.
The integrator system home page may also include one or more direct links to various other major sections of the web-based scientific product purchasing system. For example, the FIG. 4 site map shows links to sections encompassing Products & Services, Ordering, Become a Customer, About Us, What's New, Support, and a Site Map of the buying system. By clicking on one or more of these links, the requisitioner is preferably presented with a web page containing relevant information and/or functionality.

On the home page or some other integrator system web page, there may also be a descriptive section drawing the requisitioner's attention to some specific type of information. This section may describe new suppliers that have just joined the integrator system. Alternatively or additionally, the site may present the requisitioner with various descriptive information about new or special products, may present warning signs or other notices to the requisitioners or other users of the system, or may provide any other information that is preferably of a general interest to all customers or specifically to all new customers of the web-based integrator buying system. There may also be a list of the current suppliers that supply the integrator system. This list may include hyperlinks to the suppliers' own web sites for more information about the suppliers.

The integrator-based buying system may also allow a customer (company or requisitioner) to create a personal home page on the system. Rather than presenting "teasers" or other general information as on the more general home page described above, the personal home page preferably contains information tailored to the specific customer logged into the system. The customer may select and arrange
the various order request methodologies and some other information on the requisitioner's company's home page.

The above description describes registering, logging onto, and administering accounts on the present buying system. Once the requisitioner or other user has properly logged into the system and is content with the account administration options, the requisitioner may preferably locate, request, or purchase one or more items from the system. There may preferably be at least five ways for a requisitioner to identify a product for eventual purchase. These methodologies preferably provide the requisitioner with various ways to fill his/her virtual shopping cart until the requisition is approved into an order.

In FIG. 4, the exemplary site map identifies a "rapid order" feature to be used if certain information about the product is already known to the requisitioner; a "hot lists" feature that allows a requisitioner who is a registered user to select from a saved list of products added to his or her shopping cart; a "templates" feature that allows a requisitioner to add to the shopping cart a previously saved list of products; and a "catalogs" feature which allows the requisitioner to browse through a list of one or more online catalogs of products from various suppliers. Finally, there may be a "search" or "advanced search" feature that allows a requisitioner to search all or a subset of the integrator's catalog content (inventory) to identify a product for purchase. The WebReq feature described below is generally made available only to the requisitioners associated with certain companies.

By selecting one of the various "rapid order" links, the requisitioner is preferably presented with the rapid order form, example shown in FIG. 6. The rapid order form is for requisitioners who know certain information about the product they
wish to purchase on the web-based scientific product purchasing system. With rapid order, the requisitioner merely needs to enter a catalog number, quantity, and unit of measure of a product to select that product for purchase. The catalog number that the requisitioner enters can be (1) a manufacturer part number, (2) a distributor catalog number, or (3) a customer-specific number for the product (e.g., a stock room number). As long as the integrator makes a cross-reference to the customer-specific number, then this number may be used in rapid order. By allowing the requisitioner to enter whatever catalog number they are familiar with, the present invention may provide an increased amount of flexibility over other web-based ordering systems. There may also be an error correction screen (confirmation) to correct unit or measure and selection of duplicate products (e.g., products with the same part number from different suppliers).

Once the catalog number, quantity, and unit of measure for an item or list of items is complete, the requisitioner may add the item or items to their virtual shopping cart. Because a requisitioner may only be able to rapid order some of their needed scientific products, the present invention includes a digital shopping cart that allows the requisitioners to "hold" these previously ordered items in the shopping cart while the requisitioner uses the various other ordering methodologies (templates, catalogs, etc.) to add other products prior to making any final buying decision.

The requisitioner may also request a product using a predefined product template. As seen in FIG. 7, a template is a list of products that a requisitioner saves as part of his or her profile so that a similar request may be placed in the future. The template is typically a list of items. The quantities and sizes of the items (or other features) may preferably be customizable after the contents of the
template are added to the shopping cart. The template may be suited for placing a recurring order, either by adding the order to the shopping cart on a regular basis or by loading the template as part of a regular batch process. The products in a template may also be added, as a whole, to a partially-filled shopping cart.

A template may have been created from an order page (for example from an earlier shopping cart), where the system presents the requisitioner with a template creation button or other selectable device. There may also be a template creation page where a requisitioner can define the contents of a template without actually purchasing the contents at that particular time. After the template contents are added to the requisitioner's current shopping cart, the editing, checkout, and purchase of the template items proceed in the same way as described with respect to the other buying methodologies.

Similar to the templates of FIG. 7 are the hot lists of FIG. 8. A hot list is a quick requisitioning technique where the requisitioner is presented with a list of previously-identified products that can be individually adjusted or edited before being added, usually individually, to the requisitioner’s shopping cart. The hot lists of the example shown in FIG. 8 present the requisitioner with an order for acetone, an RIA kit, SOD phosphate, and a thermometer. The catalog numbers for these items are displayed and the requisitioner can select a quantity and unit for each of the items on the list (including leaving the setting at none). Once completed, the products on the hot list for which a non-zero quantity was selected can be added to the shopping cart and later purchased in the same way as any other item in the system. One or more hot lists may be saved to either the requisitioner's profile (to be used by that requisitioner in the future) or to the company profile (to be used globally by any
company requisitioner), on-line or in a batch load to the database server. Individual items may also be added to a selected hot list from the current shopping cart.

The requisitioner may also place a requisition for a product by browsing through one or more on-line supplier catalogs. As previously described, each of the suppliers may have a regular paper catalog that is used to advertise and sell its products in the off-line world. The integrator-based buying system may have one or more on-line catalogs for each its suppliers. From the FIG. 1 example, the integrator buying system may include three catalogs from distributor $D_{S}$, one catalog each from primary suppliers $D_{G}, M_{A},$ and $M_{C},$ and one other catalog that collects all of the third party suppliers $M_{K}, M_{L}, M_{M}$ together (because each individual third party supplier may not have enough catalog items on the integrator system to create their own catalog). These catalogs can also be accessed from catalog name hypertext links preferably found on many of the integrator system's web pages.

In many instances, each requisitioner associated with a company may view all of the available catalogs on the system. However, a supplier or an account administrator for a company may be able to prevent one or more requisitioners from either seeing a certain catalog or from allowing the requisitioner to request items from a particular catalog. This "pre-selection" may be used to allow each requisitioner to be presented with a personal list of available catalogs or catalog content.

More commonly, either a supplier or a company may prevent one or more (or all) requisitioners for a company from viewing content or requesting products from certain supplier catalogs. For example, a supplier may interact with the business logic of the integrator system and say that its catalog should not be shown to hospitals. When a requisitioner using a hospital account (identified in part of the
company or requisitioner profile) selects to view available catalogs, the business logic will preferably prevent the hospital requisitioner from viewing this particular supplier's catalog(s). On the flip side, a supplier could also inform the integrator system that it wishes to only publish its catalog (or a portion of its catalog) to one or more distinct companies or requisitioners. In this way, a supplier may only offer one or more products to selected customers, rather than all of the customers of the buying system.

The account administrator may also prevent requisitioner catalog access to implement the company's business rules. The administrator may prevent either viewing access or product request access for a supplier or a portion of a supplier's catalog. The administrator may block viewing access to a catalog or product by one or more requisitioners. Likewise, the administrator could allow full viewing access to a catalog or product but may restrict a requisitioner's ability to request those products. Finally, the integrator system, as controlled at the company profile level, may "steer" one or more requisitioners either toward or away from a selected product or supplier by manipulating the order in which catalog or catalog search results appear on the requisitioner's screen.

When the requisitioner decides to look at the contents of a certain catalog, the requisitioner need only select the appropriate catalog hyperlink. For example, after selecting a distributor $D_p$ catalog hyperlink, the requisitioner is preferably presented with an index or other selectable content classification scheme (such as a hypertext version of the alphabet). The requisitioner may then "drill down" through the index tree until one or more products satisfy the requisitioner's criteria requirement has been identified and selected.
This catalog entry selection preferably generally corresponds to the products that exist in the paper version of the same catalog. In some embodiments of the present invention, third party or other small suppliers may not have sufficient content to support an entire catalog. In some of these situations, the integrator site may incorporate the third party product descriptions into one or more supplier catalogs rather than separate third party catalogs. For example, if a distributor $D_p$ catalog contains a long list of flasks, and a third party supplier has only one or two, the third party's flasks may be "virtually" incorporated into the relevant sections of the distributor $D_p$ catalog. In an extreme case, in an embodiment where the integrator site treats all but one supplier as a third party supplier (see Fig. 3), all of these third party products may be virtually incorporated into the supplier $D_p$ catalog.

Rather than drill down through the various catalog index trees, the requisitioner may also use a search engine (e.g., on database serve $DS_A$) to browse the contents of the product catalogs. This search preferably runs across all of the available catalogs. Again, a supplier or an account administrator may use the company/requisitioner profile to implement supplier or company business logic to prevent certain supplier catalogs from being viewable (searchable) or to prevent the catalog's products from being selected to be added to the shopping cart. The search engine may allow the requisitioner to search for a single keyword, multiple keywords using Boolean connecting expressions (e.g., and, or, not, etc.), and/or the search engine may allow the requisitioner to perform a parametric search on various catalog content fields.

There may also be one or more advanced search pages that present the requisitioner with more options that can be selected when using the search engine.
The advanced search page may preferably allow the requisitioner to perform a general search on one or more keywords, a supplier or user-defined catalog number, the product vendor or supplier name, and/or the vendor or supplier part number. These searches may be initiated by entering one or more words into text boxes next to each search heading and selecting a search button or other selectable device.

There may also be an advanced search area that allows the requisitioner to search based on the characteristics of a chemical that the requisitioner intends to request. For example, the chemical search may allow the requisitioner to search the relevant chemical catalogs by catalog number, chemical name, CAS#, and/or molecular formula. There may also be a link to a structure/substructure search engine that allows the requisitioner to search based on a full or partial chemical name, a full chemical structure, a partial (substructure) chemical structure, and/or the chemical formula of the product. The structure/substructure search page may provide the requisitioner with a drawing palette of various chemical substructures and symbols to draw the chemical structure or substructure. For example, a browser plug-in (such as CAMBRIDGESOFT CHEMDRAW) may be used to draw the structure. After the name, structure, or formula is complete, a selectable search button can be utilized to return the appropriate results of the search.

The advanced search page may also have a link to the various supplier catalogs available as part of the integrator-based buying system. There may be a selectable list of available catalogs by topic, or the page may present the requisitioner with a preferred list of featured catalogs. For example, a hypertext list of one supplier's catalogs or catalog segments may be presented to the customer as part of the buying system.
The search results page (or the final drill down page from the catalog browsing options) are preferably customizable based on the company or requisitioner profiles as well as the business logic that preferably resides on the integrator database server, $DS_A$. For example, assume that the integrator system is a completely separate entity from all of its underlying suppliers as shown in FIG. 1. The search results page for a sample search on this system for a [Class A volumetric flask] is shown in FIG. 9.

FIG. 9 shows that the search results are broken up into groups based on the catalog from which the search "hit" was located. Either arbitrarily or by virtue of a requisitioner profile setting, the catalogs results in this example begin with the primary supplier $D_F$ and continue through the rest of the primary suppliers and on through the third party suppliers $M_L$, $M_K$, $M_M$ collected in one third party catalog. The indentation of the search results in FIG. 9 expand out to the right as subcategories of the distributor $D_F$ on-line catalog are opened. Notice that TAQ products may be located at different subheadings in the various different catalogs. Also, there is more than one manufacturer of TAQ products found in both of the distributor catalogs $D_F$, $D_G$. Because these two suppliers are distributors (not manufacturers), their catalogs contain multiple vendor names.

The final grouping shown are the third party catalogs. It may be preferred to show these catalogs last because the content of these catalogs may be sparse compared to the content of the primary supplier catalogs. Because the integrator has an active data-sharing relationship with its primary suppliers, and because these suppliers preferably actually have a printed version of their catalog, the on-line content of the primary suppliers may be rich.
The manufacturer names and product designations in the list of TAQ products are preferably hyperlinked to more detailed information about each item, just as a full and complete description of the product is available from database server $DS_A$ and web server $WS_A$. There may be an image of the product from one or more angles, and there may be one or more tables that describe the different available features of the present item as well as operating limits, safety precautions (such as hyperlinks to on-line Material Safety Data Sheets), and other information. While some or all of these data may reside on the integrator computer system, other portions may be retrieved via background queries to suppliers. This product information page may also contain a selectable screen button or other device to present the requisitioner with even more detailed information about the selected item. This detail page may contain even more information about the selected item. In either of these two pages, there is preferably a button or other selectable device to add one or more of these items to the requisitioner's electronic shopping cart as with the other requisition methodologies.

The description pages may also contain a requisition table for all of the different models of TAQ items (or any item) that the catalog offers to customers. In this way, the requisitioner merely needs to enter a quantity and choose to add the item to his or her shopping cart. These pages also allow the requisitioner to add the presently selected item to one or more of the requisitioner's or company's hot lists.

The catalog drill down and search results may alternatively "prefer" one or more suppliers. For example, if the integrator site coexists with a distributor $D_f$ site (as in FIG. 2 or FIG. 3), the search results may favor products that come from the distributor $D_f$ catalog (e.g., place these products at the top of the page). Also, the
content of the catalog descriptions may not be as uniform as with other embodiments of the present invention. For example, the favored distributor $D_f$ may have authored detailed descriptions for certain vendor products, and may not have for others. The vendors themselves may have authored detailed descriptions (although possibly not as complete as the $D_f$ content) for some other products. Some of the vendor products may not have detailed authored content at all. Likewise, the third party manufacturers may have authored detailed descriptions for the integrator site (even though these third party products are not part of the distributor's $D_f$'s catalog).

For another search (e.g., breakers) FIG. 10 illustrates search results presented in an order to prefer the host distributor $D_f$. The search results may be given in the following order: distributor $D_f$ authored catalog content; vendor-authored catalog content; third party authored catalog content; distributor $D_f$ short descriptions; vendor short descriptions; and third party short descriptions. Alternatively, the company or requisitioner profiles may be set up by an administrator (or by the integrator by default) to display the results in a different order. Alternatively, on a company-specific basis, integrator $I_A$ may implement a priority scheme in which the search results are ordered in a way that is specified in the company's profile. These search results are preferably hyperlinked to one or more detailed description pages as described above, and the requisitioner can add these products to his/her shopping cart in the same way as with the other requisition methodologies. If the detailed descriptions of selected products do not reside on the integrator system (e.g., third party products), then the integrator system will preferably background query to the supplier's third party's host computer, web server, database server, or some other third party computer to receive this information without having the requisitioner leave the integrator web site.
After adding products to the shopping cart by the various requisition methodologies, the contents of the shopping cart may be viewed and requested. A partially full shopping cart is shown in FIG. 11 (accessed by selecting to “view shopping cart” from any page). The shopping cart preferably includes a description of the product, a catalog number (e.g., the integrator system catalog number), a quantity, a price per item, a warehouse (or geographic location) from which the item will be sent, the availability or promise date for the item, and the subtotal for that item. The price, availability status, warehouse, and/or promise date were preferably updated in real-time based on a background query from the integrator site to each applicable supplier computer system to locate this information as described above. The total price including sales tax and shipping may also be included in the shopping cart. This page may allow the requisitioner to edit the contents of the shopping cart, transfer contents of the shopping cart to a hot list or into a new order template, or complete (checkout) a final order. The system preferably allows the requisitioner to utilize only one shopping cart at a time, or the system may allow multiple shopping carts to be used simultaneously.

Along with the shopping cart, the system web pages may also utilize a "cartlet." The cartlet preferably contains the items that the requisitioner has selected for purchase as part of the present session on the integrator-based buying system. The cartlet serves the same function as the full shopping cart, except that the cartlet will typically be visible as part of the presently viewed web page. The cartlet may have a less detailed description of the chosen items than the shopping cart, but the cartlet's visibility may be desired by some requisitioners. The cartlet may have a "checkout" feature that functions identically to the same feature on the full-view shopping cart, or the cartlet may be just for viewing.
Although the cart and cartlet seem straightforward, the actual function of the carts may be quite complex in a multi-tiered purchasing system. For example, if a requisitioner requests a product, the information necessary to complete that order request may reside on more than one computer. The integrator web server, host computer, and/or database server may contain profile information about the customer and descriptive information about the product to be ordered, but the supplier system host computer (web server and/or database server) may preferably include the more detailed information about the product, the product availability or promise date, and/or the warehouse from which the product will come. Likewise, certain financial information about the customer's account with that supplier (including contract price or discount) may also reside on the supplier host computer (or other supplier computer). Therefore, when a request is made, the customer's personal computer (the requisitioner) interacts with the buying system's web server WS_A (the server), which interacts (preferably in real-time) with the supplier's computer system. Then, this pricing and availability information is passed back to the integrator system web server (and parsed into a completed order item) to be transferred to the requisitioner. From the requisitioner side of the transaction (the user's computer), this multi-tiered data transaction appears seamless.

The pricing algorithm or discount is preferably agreed upon between the customer and the integrator or the customer and the supplier prior to account setup. The mathematical algorithms or conversion tables used may be virtually limitless in number and/or complexity. However, there may basically be a list price for the good, some adjustment made to this list price (e.g., subtract 15% from list price), and a resulting net contract price returned to the customer.
The availability or promise date information may also reside on either an integrator or supplier host computer, database server, or web server. The integrator may receive some availability information on a daily or some other predetermined basis as part of a batch process with the supplier. To get more timely information, the integrator web server may preferably request real-time product availability status and/or a product delivery promise date by background query to a supplier host computer or other server. The query is preferably sent to the supplier along with the customer’s account number (either with the integrator or the supplier). The supplier may then use this account number (or some other geographic identifying information such as a zip code) to determine where the closest supplier warehouse to the customer is located. The supplier's inventory and warehouse records may then be searched to determine an appropriate availability status (e.g., in stock, on backorder, etc.) and/or delivery promise date.

To illustrate a range of possibilities in the web-based integrator system, an example is provided. In this example, the requisitioner uses the buying system of the present invention to select different products, from different suppliers, using different requisitioning methodologies, and adds the resulting three order lines to a pending requisition which is later converted into a single order from the requisitioner's company to the integrator.

The requisitioner is a scientist who has developed a quality control test involving mixing samples with three chemicals in a particular proportion, measuring the pH of the reaction mixture, filtering the reaction mixture after heating it to 150 degrees for one hour, and then weighing the recovered solids. The scientist works at the central research facilities of Company A and, as a result of the development
efforts, has made repeat orders for the three chemicals in 500 ml bottles. The scientist plans to visit three of Company A’s manufacturing sites in three different states to evaluate his test method on samples of the in-process materials at each manufacturing site.

5 In preparing for the trip to the first manufacturing site, he realizes that the site lacks an appropriate pH electrode to measure the reaction mixture. Accordingly, he logs into the integrator computer system, provides his registration number and password and is presented with a choice of account numbers (from a pull-down menu listing integrator account numbers for the central research facility and five manufacturing sites). He selects the account number for the first site, and also (in a customer-specific data field defined for Company A), designates the Project Number for quality control methods development. He is now ready to start selecting items for a future order to be delivered to that first manufacturing site.

10 In this example, the first product is a pH electrode requested by way of a "catalog search." In a catalog search, one or more keywords for a desired product (product A) are entered by the requisitioner, e.g., “pH” and “solid state”. The integrator computer system searches, based in part from information stored on the integrator database server, to identify the "hits", i.e., matching products provided from various suppliers. Assume that the pH meter used at the first manufacturing site is of older type and requires a different connector than the one he uses at central research. Under these circumstances, assume that all of the pH electrodes (solid state) that he finds are of the wrong connector type. But two of the brands represented by distributor F would otherwise meet his requirements.
If the matching products are not exact matches, the requisitioner may wish to view more products from the supplier of a "close" match. The requisitioner selects the closest matching product from a particular supplier, for example, $D_r$. In this example, the integrator computer system will "punch-out" to supplier $D_r$'s computer, based upon a prearranged protocol. In punching out, the integrator computer system will take the requisitioner product query information and relevant information from the customer profile (such as the requisitioner's $D_r$ account number, if present, as well as the login name and password for the supplier computer system). The integrator computer system sends a message in, for example, XML format, to the supplier $D_r$ computer. Because of pre-arranged coordination with the integrator computer system, the supplier computer system identifies the request and uses the embedded supplier system login information (or other customer-specific data) to access the supplier system.

After this punch-out login, the requisitioner is preferably presented with a frame, a window, an overlay, or some other web device that allows the requisitioner to view the contents of the supplier web site without leaving the requisitioner's current session on the integrator system. Preferably, the supplier site is shown within a frame of the integrator site, so that the requisitioner will still see the border and URL of the integrator site.

In the supplier frame or window, the requisitioner is shown a web page that enables the requisitioner to browse the content of the supplier's catalogs and/or perform a further search on the content of these catalogs. For example, the first web page shows solid state pH electrodes available from distributor $D_r$ of a first brand, in several different models with different style connectors. The web page is being
communicated to the requisitioner from the supplier site through the integrator web session. The "look and feel" of the supplier window will primarily be determined by the supplier site.

The requisitioner will perform a search or drill down through the supplier catalog to find a more exact match to his or her desired product. Thus, if the connector style of interest is not on that first page, a Boolean search on distributor \( D_f \)'s site with "pH", "solid state" and a designation of the desired connector style may produce a hit list from which the requisitioner can view appropriate electrodes of two different brands, each available through distributor \( D_f \). Preferably, there is a "local" shopping cart or other device that holds each product (electrode) that the requisitioner's selects (on the supplier \( D_f \)'s site) until the requisitioner is finished selecting products. For now, assume that the requisitioner selects two electrodes, one of each brand. As the requisitioner selects items for the shopping cart, supplier \( D_f \)'s site will also typically look up price, availability, promise date, or other real-time product information about each selected product using the information communicated to the supplier site from the integrator site. Once finished, the supplier site window or the integrator site outer frame will preferably present the requisitioner with a web page button or other selectable device that acts as a local "checkout" for the products in the local shopping cart.

After selecting "checkout," the supplier site typically transfers all necessary real-time product information (e.g., on both selected electrodes) back to the integrator computer (via XML, EDI, OBI, etc.) and closes the local session (supplier side) with the requisitioner. The integrator site may then close the window, frame, overlay, or other web device that contained the supplier site session. Preferably, the
products that were "checked out" on the supplier site have been transferred into the requisitioner's integrator site shopping cart (added to whatever other products may have been in the shopping cart before the punch-out). Thus, the shopping cart on the integrator site will now show two electrodes of different brands, which is available for immediate shipment to the first manufacturing site and the price that the integrator will charge Company A for each electrode.

In this example, the requisitioner also desires a second product (product B), perhaps one of the three chemicals (e.g., acetone) in a 100 ml size. The requisitioner may browse on the integrator web site through on-line catalogs and find a product that appears to be sufficient for his/her needs. The integrator computer system then "queries" the identified supplier computer system in the background, i.e., without changing the screen viewed by the requisitioner, for product availability for shipment to the first manufacturing site and price.

For example, the requisitioner may select product B from the catalog of supplier MC. The integrator computer system obtains real-time price, availability, and/or promise date information. Because the computer systems of both the integrator and the supplier have been coordinated to communicate this information (via XML, OBI, EDI, etc.), the integrator can query the supplier computer (preferably in the background of the requisitioner's session with the integrator), to obtain this real-time information.

Preferably, the requisitioner's session remains controlled by the integrator computer system. The request made by the integrator system to the supplier may include the requisitioner's supplier account number, product query, or
any other relevant information that will assist the supplier computer in providing the requested data. In this example, the supplier computer may need only the requisitioner's account number to determine contract pricing, warehouse availability, and promise date for the selected product.

The supplier computer will use the identifying product number for a 100 ml bottle of the first chemical and a transferred account number (or other information) to generate the requested real-time product information. This real-time product information will be sent to the integrator computer and incorporated, along with the requisitioner product query and certain customer profile information, into an order line item, showing product availability (as provided by the supplier system) and price (perhaps derived from the price quoted by the supplier system to the integrator system by applying a percentage mark-up or fee, which is coded by the integrator host computer for Company A's pricing on items obtained by the integrator from the particular supplier). This product, a 100 ml bottle of a chemical, will be added to the shopping cart along with product A.

In an alternate form of querying a supplier computer, a requisitioner's keyword or other search could be used to trigger a catalog search on one or more supplier computers. In this example, supplier computers provide a catalog search engine that accepts a string of characters (e.g., keywords) to initiate a catalog search. When a requisitioner inputs a keyword or other search into the integrator computer (for example the name or CAS number of the chemical and the quantity "100 ml"), the integrator computer converts this search query into a string of characters (a search string) that a supplier computer may use to process a search. The results of this supplier search are then sent back to the integrator computer and displayed for the
requisitioner. This requisitioner's search query can be simultaneously converted into proper search strings for several different supplier computers (because different suppliers may require the search string to be formatted differently) and sent to search all of these supplier computers.

In this example, the requisitioner also desires a third product (product C). Perhaps the requisitioner wants a container to collect the solid materials after filtration at the first manufacturing site and bring it back to the central research facility for further testing. The requisitioner may browse through the third party catalog on the integrator web site and see a small description of a third party product that may suit his or her needs. Before requesting to purchase the product, the requisitioner may wish to view a more detailed description of product C. As with product B, the integrator site may have a communicative relationship with a supplier of product C that allows the integrator computer system to query the supplier computer system, in real-time, for product information. In this case, the integrator computer system may request, for example, a fuller description of product B. In response to this query request, the supplier system will preferably pass the requested description back to the integrator system. Because this information was requested in a background query rather than a foreground query, the requisitioner typically is not aware of this information transfer between the integrator and the supplier. The requisitioner may then add this item to his or her shopping cart and a third order line item is preferably created.

If the requisitioner is satisfied that the three products in the shopping cart (the three order line items) are his or her complete order, the requisitioner will preferably select to "check-out" and create a proposed order (a requisition) for these
three items. At checkout, a requisition header is constructed based on the requisitioner’s relevant customer profile information and selections made by the requisitioner initially (e.g., the Project Number). Based on the availability information on the three products, the requisitioner may choose to modify the request at this point (e.g., request express delivery of the third item to assure that it will be at the first manufacturing site when needed). This header information is combined with the three order lines (including item descriptions, quantity and price) and the requisitioner “accepts” the order. If the total cost of the proposed order is within the requisitioner’s approval limits (as defined by his requisitioner profile), the order will then be created between the integrator and Company A and three orders will be sent to distributor F and the other two suppliers to deliver each one’s respective item to the first manufacturing site. After shipments are made, invoices are generate by the three host computers to the integrator and from the integrator to Company A.

Assume, however, that before accepting the order, the scientist realizes that he may need the same materials, plus filters, at the second manufacturing site and the third manufacturing site. The requisitioner already has, based on his orders for the central research facility, a “hot list” including the three chemicals in 500 ml bottles, the filters he uses and the standard pH electrode he uses. To facilitate future orders under the central research account number, he already has an order template for one bottle each of the three chemicals and one pack of the filters. On the check-out screen, he can designate the 100 ml size of the first chemical and both pH electrodes (with special connectors) to be added to that personal hot list. For the pending order (for the first manufacturing site) he selects one of the two pH electrodes (by deleting the order line identifying the second one); if both are available, he may select the
cheaper one. In later creating an order for shipment to a second manufacturing site
(under a different account number, but the same Project Number), he may choose the
other special pH electrode (based on availability). Alternatively, he may leave both
electrodes on the current order, intending to try both and later order only the one that
performs the best (or, if both perform equally, to select whichever is available or
cheaper).

On order acceptance by the requisitioner, if the order size exceed his
approval limits in his profile, the integrator computer system sends an e-mail to the
requisitioner/approver identified in his profile. That requisitioner/approver logs into
the system, goes to requisition review, sees the status of pending proposed orders
(requisitions) and selects this particular order for review. After looking at the five
order lines, the requisitioner/approver may approve and the order proceeds.
Alternatively, the requisitioner/approver may see that two different pH electrodes
have been selected and decide (based on personal knowledge, brand identity or
otherwise) that the cheaper of the two is at least as good and delete from the order the
more expensive pH electrode. The requisitioner/approver then approves the
requisition and it is converted into an order from Company A to the integrator and
purchase orders from the integrator to the three respective suppliers.

At the conclusion of testing at the three manufacturing sites, if the
development effort is successful, the researcher may have his company administrator
add the appropriate products (chemicals, filters, pH electrodes) either to individual
hot lists for other requisitioners at the respective manufacturing sites or to a Company
A hot list available to all requisitioners. Alternatively, he may work with
requisitioners at each site to develop order templates for repetitive orders by each
plant (using, for example, the appropriate bottle size of the three chemicals based on each one’s planned usage).

After filling the shopping cart and viewing the real-time price and/or availability information, the requisitioner may then decide to purchase some or all of the contents of the shopping cart. This process (like in a supermarket) is known as checking out. If the customer has an account with the integrator or a supplier, then the system preferably already knows the shipping information, billing information, and/or any other necessary information to bill the customer and ship the products to the customer. If the customer does not have an account with either the integrator or the supplier who will provide the product to the customer, the customer may preferably be presented with a checkout form to provide the system with cash account billing information. In such a situation, because the relevant billing and shipping information has not previously been collected by the web-based integrator buying system, the system preferably requires the requisitioner to input such information before a purchase order of any kind is created.

Because the requisitioner has accessed and is dealing with the web-based integrator buying system (and not each of the suppliers individually), the present invention may satisfy multiple supplier purchase orders with a single company purchase order (from a single requisitioner shopping cart). This single PO may simplify the buying process from the requisitioner’s point of view. For example, if the requisitioner accepts to purchase items from supplier $M_A$ and supplier $D_P$, there is preferably a single purchase order created reflecting the sale of these items from the integrator system to the requisitioner. At least two additional purchase orders are created reflecting the sale of these same items from each of the suppliers $M_A$, $D_P$ to
the integrator system $I_A$. In this way, from the requisitioner's point of view, the product was purchased from the web site. Preferably, each product is still shipped directly to the customer from the stocking manufacturer or distributor.

For some desired products, there may not be a supplier or third party catalog item identified that satisfies the inquiry. For these special circumstances, the integrator-based buying system may allow requisitioners from certain companies to fill out a web-based product requisition form ("WebReq") to request that the integrator $I_A$ locate the product from somewhere. The WebReq is a form that the requisitioner can use to source items not found by any of the conventional cart-building means: rapid order, hot list, template, word search or browsing. It is preferably accessed from the check-out screen and creates a form into which "header" info (e.g., account number, PO number, department charge, ship-to address and attention line, etc.) is copied from the customer's profile and/or from the current order. The requisitioner may type free form info about the requested product(s) into the WebReq form, so that an integrator system employee can look for the item (usually from a designated supplier) off-line, build a catalog entry for the new third party product (if required), and then create an order for that product or provide price and availability to the requisitioner or approver who makes the purchasing decision.

At this point, the shopping cart has been reviewed and the contents have been found acceptable, or a WebReq was filled out and a satisfying product has been found. The requisitioner now must approve the order (if his requisitioner profile allows such action) or await approval from an authorized approver or account administrator. This effectively ends the request and order of a product as part of the integrator site, but there are preferably some "housekeeping" functions that may be
useful in using the integrator buying system. In FIG. 4, two of these pages give the functionality to review recent requisitions made by the requisitioner or by an approver of same or all of his/her requisitions (to view order status) and to view the accepted orders for the current account number from the host computer (to see what other activity occurs with your account).

When a requisitioner requests to see the requisition history, the requisitioner is presented with a page that shows recent requisitions made by that requisitioner. Depending on whether the current requisitioner is an administrator (or approver) or a lower level requisitioner, the requisitioner may be presented with different web page options. A requisitioner may preferably only see the requisitions that he or she has recently placed. An approver may see a list of all requisitions that he or she is authorized to approve. The requisition page preferably displays a list of the order dates, PO number, account number, total purchase price, and requisitioner. An approver may be given the choice to either approve, deny, or postpone each requisition. In this way, the account administrator or approver may have more control over not only whether or not a requisition is allowed, but also when a requisition is allowed to go through (by postponing the requisition for a period of time).

A lower-level requisitioner (user) is preferably not given the choice of whether to approve or disapprove an item for purchase (unless the requisitioner's profile allows such approval). Instead, the requisitioner may be given an update as to the status of the various requisitions that that particular requisitioner has requested recently. The most recent requisitions may still be waiting at the integrator's customer service. There may also be a "view details" selectable button that provides the requisitioner with more detailed information about where in the purchasing chain
the requisitioned product currently resides. Toward the end of the list of requisitions, there may preferably be requisitions that have already been approved (and/or processed). With these processed items, there may preferably be a tracking number or other shipping code provided for the order with a hypertext link to the web site of the shipping company (where more information about the current state of delivery may be found).

An order history or order review page may preferably present the customer with a list of all prior requisitions that have resulted in successful orders for a given account number. An order history or order review may preferably go back to the host computer for a user's account and display a list of all the orders from all sources for a particular account. When using the integrator system, the order review may be useful to see what “other” users of the same account have been purchasing to prevent overlap or overspending.

The above specification describes several different embodiments and features of a web-based buying system. Various parts, selections, and/or alternatives from the various embodiments may preferably be interchanged with other parts of different embodiments. Although the invention has been described above in terms of particular embodiments, one of ordinary skill in the art, in light of the teachings herein, can generate additional embodiments and modifications without departing from the spirit of, or exceeding the scope of, the claimed invention. Accordingly, it is to be understood that the drawings and the descriptions herein are proffered by way of example only to facilitate comprehension of the invention and should not be construed to limit the scope thereof.
CLAIMS

WHAT IS CLAIMED IS:

1. A purchasing method comprising the steps of:

   maintaining at least one customer profile associated with each of
   multiple customers;

   presenting a product query from one of said customers having an
   associated customer profile;

   obtaining real-time product information, from a supplier database
   remote from the customer profiles, responsive to said product query using data
   from said associated customer profile; and

   using said real-time product information in constructing an order line.

2. The method of claim 1 further comprising the step of
   assembling a requisition based on data contained in said customer profile.

3. The method of claim 1 wherein said product query is presented
   using a methodology selected from the group consisting of order templates,
   hot lists, rapid orders, catalog searches, catalog browsing, and web requisition
   forms.

4. A buying system comprising:

   a first computer system maintaining at least one customer profile
   associated with each of multiple customers;
multiple second computer systems, each associated with at least one supplier, maintaining real-time product information;

means for presenting a product query from one of said customers having an associated customer profile to said first computer system; and

means for obtaining real-time product information, from one of the second computer systems, responsive to said product query based upon information in said customer profile.

5. A web-based buying system comprising:

at least one customer profile associated with each of multiple customers;

a product query from one of said customers having an associated customer profile; and

means for creating an order line using real-time product information, from a supplier database remote from the customer profiles, responsive to said product query using said customer profile.

6. The buying system of claim 5, wherein said real-time product information includes product availability.

7. The buying system of claim 5, wherein said real-time product information includes a product delivery promise date.

8. The buying system of claim 5, wherein said real-time product information includes a product expiration date.
9. The buying system of claim 5, wherein said real-time product information includes a product inventory lot number.

10. The buying system of claim 5, wherein said real-time product information includes a product price.

11. The buying system of claim 5, wherein said customer profile includes a product requisition approval limit.

12. The buying system of claim 5, wherein said customer profile comprises a requisitioner profile and a company profile.

13. The buying system of claim 12 wherein said requisitioner profile includes a product requisition approval limit and an identifier of another requisitioner to whom requisitions over the product requisition approval limit are to be presented for approval.

14. A method of using a customer profile in a buying system comprising the steps of:

   maintaining at least one company profile associated with each of multiple customers;

   maintaining requisitioner profiles for requisioners associated with designated customers, each requisitioner profile being associated with at least one company profile; and

   selecting data to be provided to a particular requisitioner based on the company profile associated with said requisitioner.
15. The method of claim 14 wherein the data identifies particular catalogs that the requisitioner may access.

16. The method of claim 14 wherein the data identifies particular suppliers with whom the requisitioner may place orders.

17. The method of claim 14 wherein the data identifies limitations upon the requisitioner's authority to place selected orders.

18. The method of claim 17 wherein said limitations relate to the requisitioner's price limit for an order.

19. The method of claim 17 wherein said limitations related to identifying particular accounts for which the requisitioner may place an order.

20. A method for web-based buying comprising the steps of: maintaining at least one customer profile associated with each of multiple customers, wherein said customer profile includes at least one company profile and at least one requisitioner profile;

      presenting a product query from one of said customers having an associated profile; and

      creating an order line using real-time product information, responsive to said customer profile.

21. The method of claim 20, further comprising the step of calculating a product price based on the customer profile.

22. A buying system comprising:
an integrator computer;

one or more suppliers capable of providing real-time product information to said integrator computer in response to a product query based on customer profile data received from said integrator computer.

23. The buying system of claim 22, wherein said real-time product information is selected from the group consisting of billing information, shipping information, and order history.

24. The buying system of claim 22, wherein said integrator computer provides comparison of selected product information received from two or more suppliers.

25. The buying system of claim 22, wherein said product information resides on a supplier computer.

26. The buying system of claim 22 wherein said product information resides on at least one supplier computer associated with selected suppliers, said supplier computer capable of communicating with said integrator computer.
REGISTRATION

NAME*:  
  FIRST  
  LAST  

USERNAME*:  

PASSWORD*:  

PASSWORD HINT:  

COMPANY*:  

PHONE*:  

COMPANY*:  

PHONE*:  

EMAIL ADDRESS:  

WOULD YOU LIKE TO RECEIVE EMAIL CONFIRMATIONS FOR YOUR ONLINE ORDERS?

EMAIL CONFIRMATION:  

WHERE DID YOU HEAR ABOUT THIS SITE?  IF OTHER:  

FIG. 5
7/12

RAPID ORDER FORM

<table>
<thead>
<tr>
<th>CAT. NO.</th>
<th>UNITS</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
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</table>

ADD TO CART

FIG. 6
<table>
<thead>
<tr>
<th>TEMPLATE NAME: MONDAY MORNING ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>KIMWIPES SML 4/1/2X8 1/2 280/PK</td>
</tr>
<tr>
<td>BEAKER GRIFFIN 250 ML 12/PK</td>
</tr>
<tr>
<td>THERMOMETER ASTM 9F</td>
</tr>
<tr>
<td>ACETONE CERTIFIED ACS IL</td>
</tr>
<tr>
<td>BEAKER GRIFFIN 50 ML 12/PK</td>
</tr>
<tr>
<td>CORRKS XXX #10 PK/100</td>
</tr>
<tr>
<td>PIPET CREAM 18ML 1/CS</td>
</tr>
<tr>
<td>SYRINGE GLASS 30CC MELT TIP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAT NO.</th>
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<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>06-666A</td>
<td>1</td>
<td>PACK OF 280</td>
</tr>
<tr>
<td>02-540K</td>
<td>1</td>
<td>PACK OF 12</td>
</tr>
<tr>
<td>13-500</td>
<td>1</td>
<td>EACH</td>
</tr>
<tr>
<td>A18-1</td>
<td>1</td>
<td>CASE OF 6 EA</td>
</tr>
<tr>
<td>02-539G</td>
<td>2</td>
<td>PACK OF 100</td>
</tr>
<tr>
<td>S5902</td>
<td>2</td>
<td>CASE</td>
</tr>
<tr>
<td>10-310-205</td>
<td>1</td>
<td>EACH</td>
</tr>
<tr>
<td>14-825-10B</td>
<td>1</td>
<td>EACH</td>
</tr>
</tbody>
</table>
FIG. 9
CATALOG DRILL DOWN

FISHER CATALOG
BEAKERS
REUSABLE

FISHERBRAND INTERMEDIATE FORM POLYPROPYLENE BEAKER WITH HANDLE
FISHERBRAND* "SQUARE RATIO" POLYPROPYLENE BEAKER SET
FISHERBRAND* PTFE BEAKERS
PYREX* BRAND GRADUATED PHARMACEUTICAL BEAKERS
PYREX* BRAND HEAVY-DUTY BEAKERS
PYREX* BRAND NO-DRIPT BEAKERS
VYCOR* BRAND BEAKERS FOR EXTREME TEMPERATURES
KIMAX* BEAKER STARTER PACK
THIRD PARTY: CHEMGLASS GRIFFIN BEAKERS
THIRD PARTY: COLE-PARMER BEAKERS, 5000ML
THIRD PARTY: COLE-PARMER PFA BEAKERS

FISHERBRAND BEAKER MUG 250ML: NC9658187
FISHERBRAND BEAKER MUG 400ML: NC9658188
FISHERBRAND BEAKER MUG 600ML: NC9658189
PYREX BEAKER, 150ML PK/12: S63243
PYREX BEAKER, 250ML PK/12: S63244
PYREX BEAKER, 400ML PK/12: S63245
PYREX BEAKER, 600ML PK/6: S63246
THIRD PARTY: BEAKER 10ML 48/CS: NC9668151
THIRD PARTY: BEAKER 20ML 48/CS: NC9668152
THIRD PARTY: BEAKER 30ML 48/CS: NC9668153

FIG. 10
<table>
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<tr>
<th>ACCOUNT NUMBER</th>
<th>DESCRIPTION</th>
<th>CAT. NO.</th>
<th>PRICE</th>
<th>QTY.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>123456-001</td>
<td>ACCUFET ELECTRODE, DIN CONNECTOR</td>
<td>13-620-755</td>
<td>$271.02</td>
<td>1</td>
<td>$271.02</td>
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<tr>
<td></td>
<td>ACETONE, ACS 100ML</td>
<td>ICN9383280</td>
<td>$8.25</td>
<td>1</td>
<td>$8.25</td>
</tr>
<tr>
<td></td>
<td>FILTER P100 PARTICULATE 2/PACK</td>
<td>18-999-2572</td>
<td>$6.21</td>
<td>3</td>
<td>$18.63</td>
</tr>
</tbody>
</table>

**SHIPPING CART**

- AVAILABLE ON: 08/08/00
- DELIVERY DATE: 8/4/2000
- SHIP FROM SUPPLIER:
  - ITEM: ACETONE, ACS 100ML
  - ITEM: FILTER P100 PARTICULATE 2/PACK

**SUBTOTAL:** $271.02

**SUBTOTAL:** $8.25

**SUBTOTAL:** $18.63

**TOTAL:** $297.90