FILE HISTORY

US 6,317,783

PATENT:	6,317,783
INVENTORS:	Freishtat, Gregg Rajan, Palaniswamy
TITLE:	Apparatus and methods for automated aggregation and delivery of and transactions involving electronic personal information or data
APPLICATION NO:	US1999428511A
FILED:	27 OCT 1999
ISSUED:	13 NOV 2001
COMPILED:	09 JUN 2011

Plaid Technologies Inc.
Exhibit 1003

jc511 U.S. PTO
09/428511
10/27/99

ISSUE CLASSIFICATION	
Class	Subclass
709	218

PATENT NUMBER
6317783
6317783

U.S. UTILITY PATENT APPLICATION

O.I.P.E.	PATENT DATE
SCANNED Sg Q.A. CW	NOV 13 2001

SECTOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
	709	~~221~~ 218	~~2155~~ 2154	Coulter

FILED WITH: ☐ DISK (CRF) ☐ FICHE
(Attached in pocket on right inside flap)

PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)	
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
709	218	707	10

INTERNATIONAL CLASSIFICATION: G06F 13/00

☐ Continued on Issue Slip Inside File Jacket

☐ TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
	11	11	5	36	1

☐ a) The term of this patent subsequent to _____ (date) has been disclaimed.

(Assistant Examiner) (Date)

NOTICE OF ALLOWANCE MAILED: 6-18-01

☐ b) The term of this patent shall not extend beyond the expiration date of U.S Patent. No. _____.

KENNETH R. COULTER
PRIMARY EXAMINER
Kenneth R. Coulter
(Primary Examiner) 6/18/01 (Date)

ISSUE FEE

Amount Due	Date Paid
$1,240.00	9-18-01

☐ c) The terminal ____ months of this patent have been disclaimed.

Brenda Mallon 6/01
(Legal Instruments Examiner) (Date)

ISSUE BATCH NUMBER: 299

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Form PTO-436A
(Rev. 10/97)

Formal Drawings (___ sht) ___

(LABEL AREA)

ISSUE FEE IN FILE

(FACE)

6,317,783

APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

Transaction History

Date	Transaction Description
11/1/1999	Initial Exam Team nn
11/15/1999	IFW Scan & PACR Auto Security Review
11/23/1999	Notice Mailed--Application Incomplete--Filing Date Assigned
2/7/2000	Application Is Now Complete
2/8/2000	Petition Entered
2/8/2000	Information Disclosure Statement (IDS) Filed
2/8/2000	Information Disclosure Statement (IDS) Filed
2/8/2000	Application Dispatched from OIPE
2/23/2000	Information Disclosure Statement (IDS) Filed
2/23/2000	Information Disclosure Statement (IDS) Filed
4/14/2000	Case Docketed to Examiner in GAU
5/3/2000	Mail-Petition Decision - Granted
6/13/2000	Information Disclosure Statement (IDS) Filed
6/13/2000	Information Disclosure Statement (IDS) Filed
6/15/2000	Information Disclosure Statement (IDS) Filed
6/15/2000	Information Disclosure Statement (IDS) Filed
10/2/2000	Case Docketed to Examiner in GAU
10/2/2000	Non-Final Rejection
10/3/2000	Mail Non-Final Rejection
10/6/2000	Case Docketed to Examiner in GAU
4/5/2001	Response after Non-Final Action
4/5/2001	Request for Extension of Time - Granted
4/16/2001	Date Forwarded to Examiner
6/18/2001	Mail Notice of Allowance
6/18/2001	Notice of Allowance Data Verification Completed
6/22/2001	Workflow - File Sent to Contractor
9/18/2001	Issue Fee Payment Verified
9/18/2001	Workflow - Drawings Finished
9/18/2001	Workflow - Drawings Matched with File at Contractor
9/18/2001	Workflow - Drawings Received at Contractor
9/18/2001	Workflow - Drawings Sent to Contractor

9/29/2001	Workflow - Complete WF Records for Drawings
10/4/2001	Application Is Considered Ready for Issue
10/25/2001	Issue Notification Mailed
11/13/2001	Recordation of Patent Grant Mailed
11/13/2001	Patent Issue Date Used in PTA Calculation

PATENT APPLICATION

09428511

jc511 U.S. PTO
09/428511
10/27/99

INITIALS ______

NOV 0 89929

CONTENTS

No.	Paper	Date received (Incl. C. of M.) or Date Mailed
1.	Application 11 pts. papers.	
2.	Fee Deficit	11/23/99
3.	Dec/Fee/Signature	1/24/00
4.	Pet. to Make Spec. accel.	2/8/00
5.	IDS + 1449	2/8/00
6.	Pet. grt'd	5-3-00
7.	Supp. IDS w/Refs	2-23-00
8.	Supp IDS	6-13-00
9.	Supp IDS	6-15-00
10.	Rej 3 mos	10-03-00
11.	Ext of Time (3 mos)	04-05-01
12.	Amdt A	04-05-01
13.	Notice of allow	6-18-01
14.	Formal Drawings (11 shts) set 1	9-18-01
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ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	VT	69607	11/2/99
O.I.P.E. CLASSIFIER			11/8/99
FORMALITY REVIEW			11-17-99

INDEX OF CLAIMS

✔	Rejected	N	Non-elected
=	Allowed	I	Interference
—	(Through numeral) Canceled	A	Appeal
÷	Restricted	O	Objected

Claim Final	Claim Original	Date 9/28/00	Date 6/16/01
20	1	✔	11
21	2		
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Claim Final	Claim Original	Date
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If more than 150 claims or 10 actions staple additional sheet here

(LEFT INSIDE)

[redacted]

SEARCHED

Class	Sub.	Date	Exmr.
707	10	8/27/00	HNC
above	updated	6/16/01	HNC
709	217	6/18/01	HNC
709	218	6/18/01	HNC

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
709	218		
707	10	6/18/01	HNC

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

	Date	Exmr.
WEST: USPT JPAB, EPAB, DERWENT, IBM TDB	8/22/00	HNC
	8/27/00	HNC
YODLEE.com	8/22/00	HNC
WEST: USPT	4/27/01	HNC
	6/16/01	HNC

(RIGHT OUTSIDE)

US006317783B1

(12) **United States Patent**
Freishtat et al.

(10) **Patent No.: US 6,317,783 B1**
(45) **Date of Patent: Nov. 13, 2001**

(54) **APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA**

(75) Inventors: **Gregg Freishtat**; **Palaniswamy Rajan**, both of Atlanta, GA (US)

(73) Assignee: **Verticalone Corporation**, Atlanta, GA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/428,511**

(22) Filed: **Oct. 27, 1999**

Related U.S. Application Data

(60) Provisional application No. 60/105,917, filed on Oct. 28, 1998, and provisional application No. 60/134,395, filed on May 17, 1999.

(51) **Int. Cl.**[7] **G06F 13/00**
(52) **U.S. Cl.** **709/218**; 707/10
(58) **Field of Search** 707/10; 709/217, 709/218

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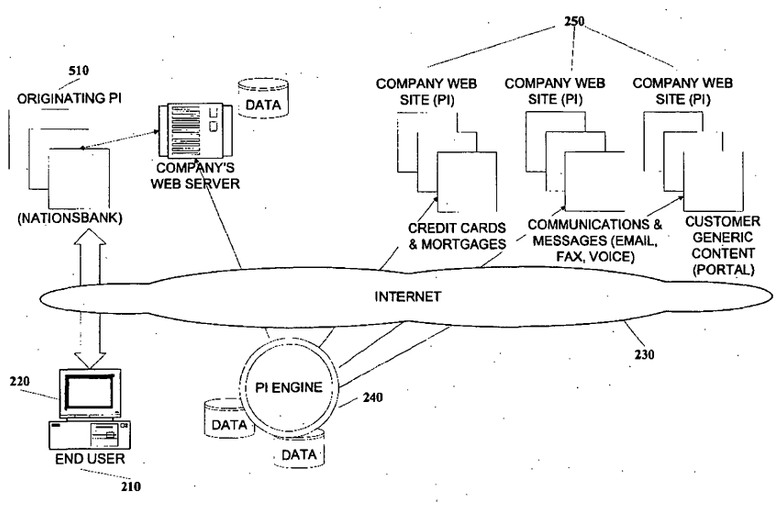
"A Softbot–based Interface to the Internet," Oren Etzioni and Daniel Weld, Communications of the ACM, vol. 37, No. 7, Jul., 1994, pp. 72–76.

Primary Examiner—Kenneth R. Coulter
(74) *Attorney, Agent, or Firm*—Needle & Rosenberg. P.C.

(57) **ABSTRACT**

A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor selects an end user for personal infonmation aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

36 Claims, 11 Drawing Sheets



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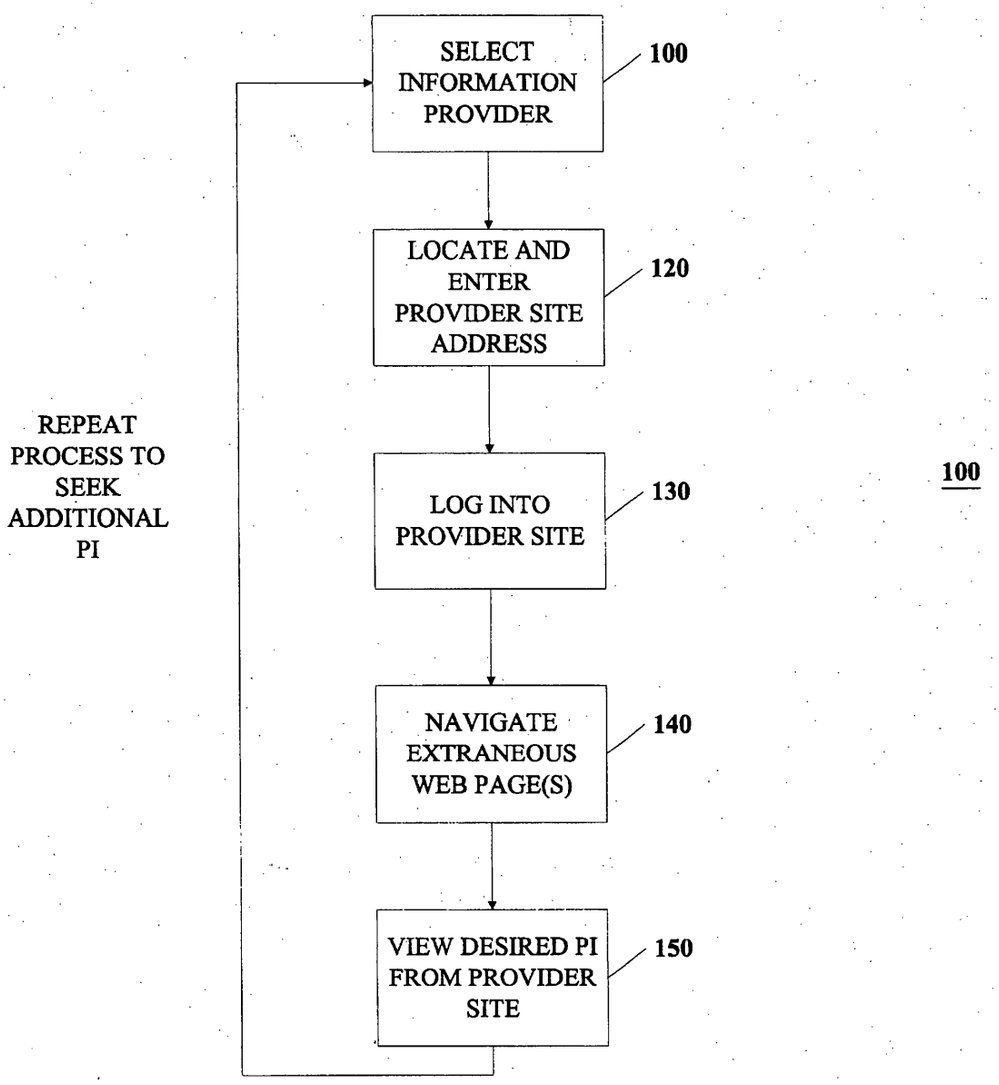
6,029,175		2/2000	Chow et al.	707/104

* cited by examiner

Figure 1
(Prior Art)



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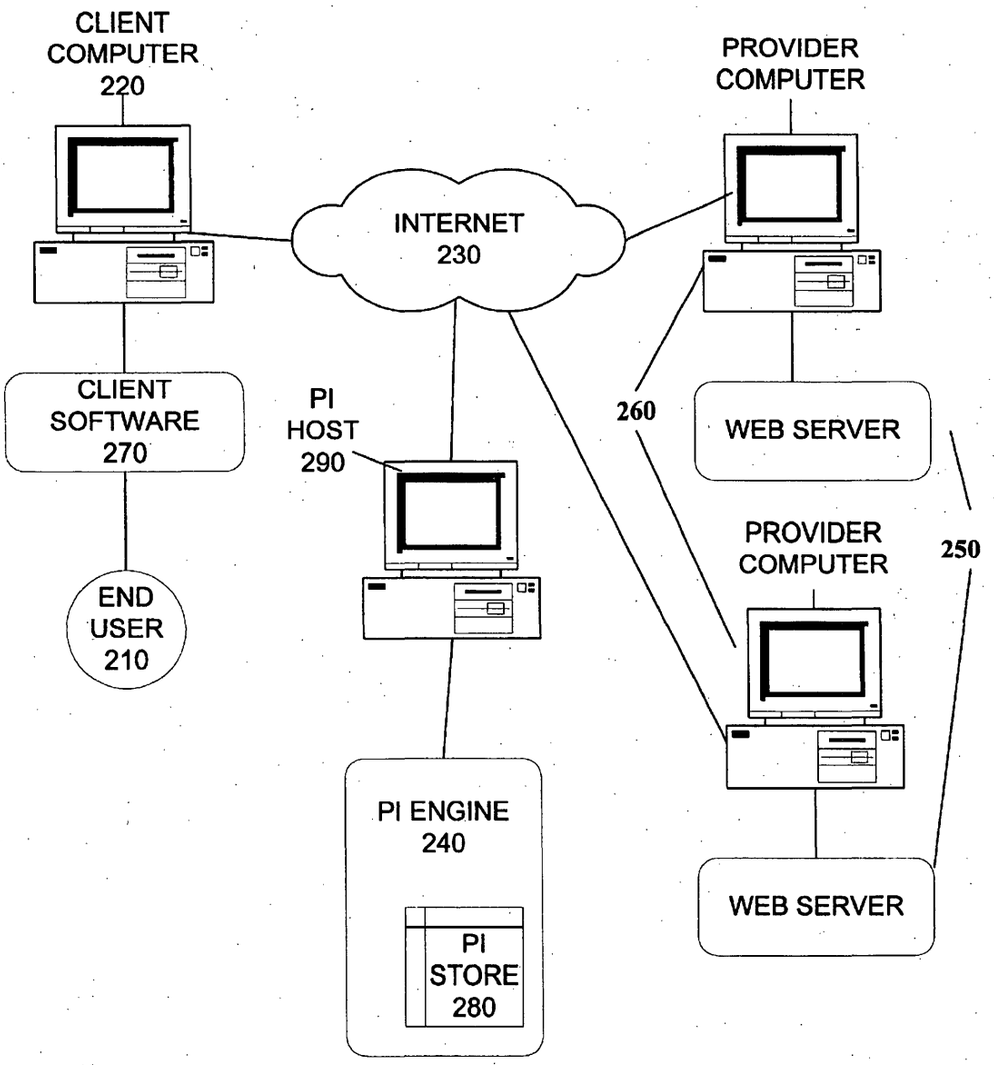

CLIENT COMPUTER 220
PROVIDER COMPUTER
INTERNET 230
CLIENT SOFTWARE 270
PI HOST 290
260
WEB SERVER
PROVIDER COMPUTER
250
END USER 210
PI ENGINE 240
PI STORE 280
WEB SERVER

Figure 3
240

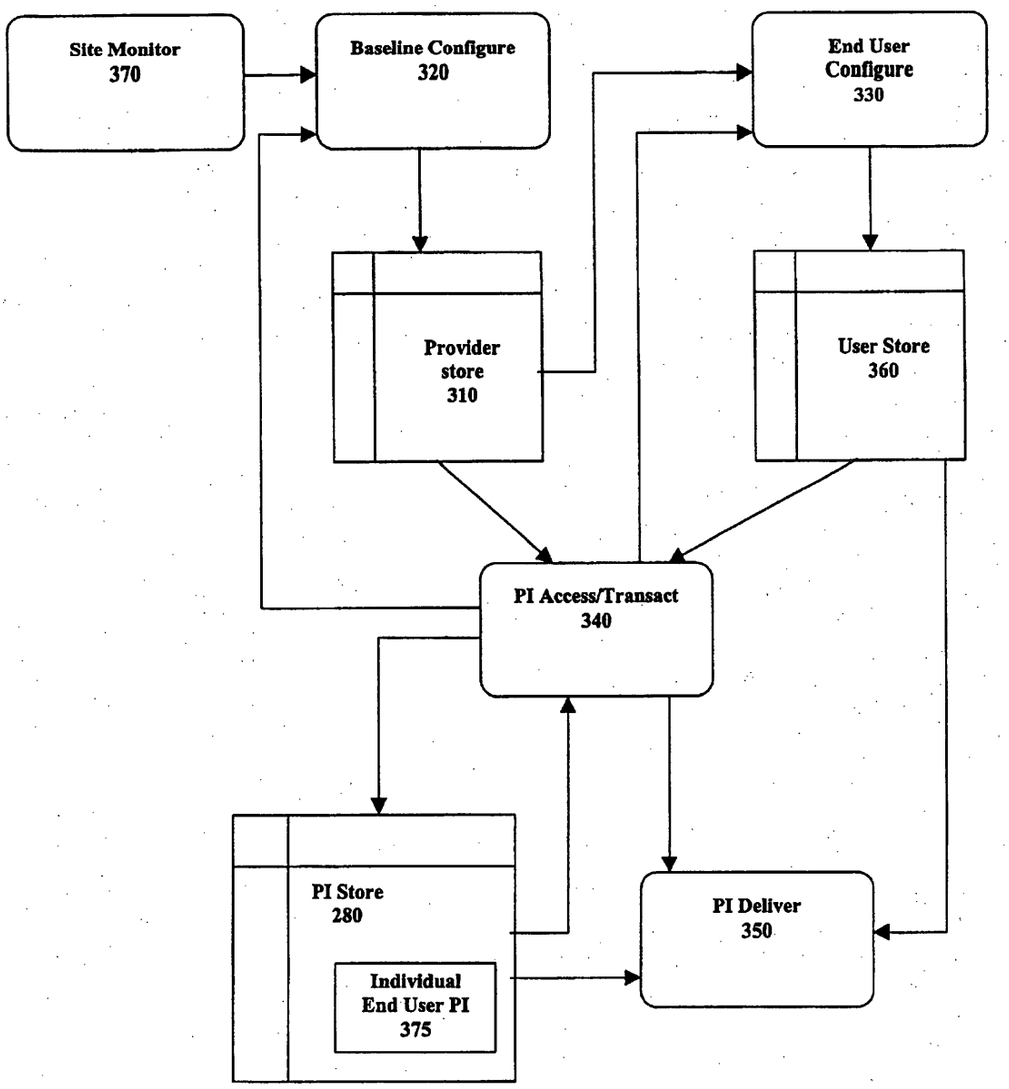
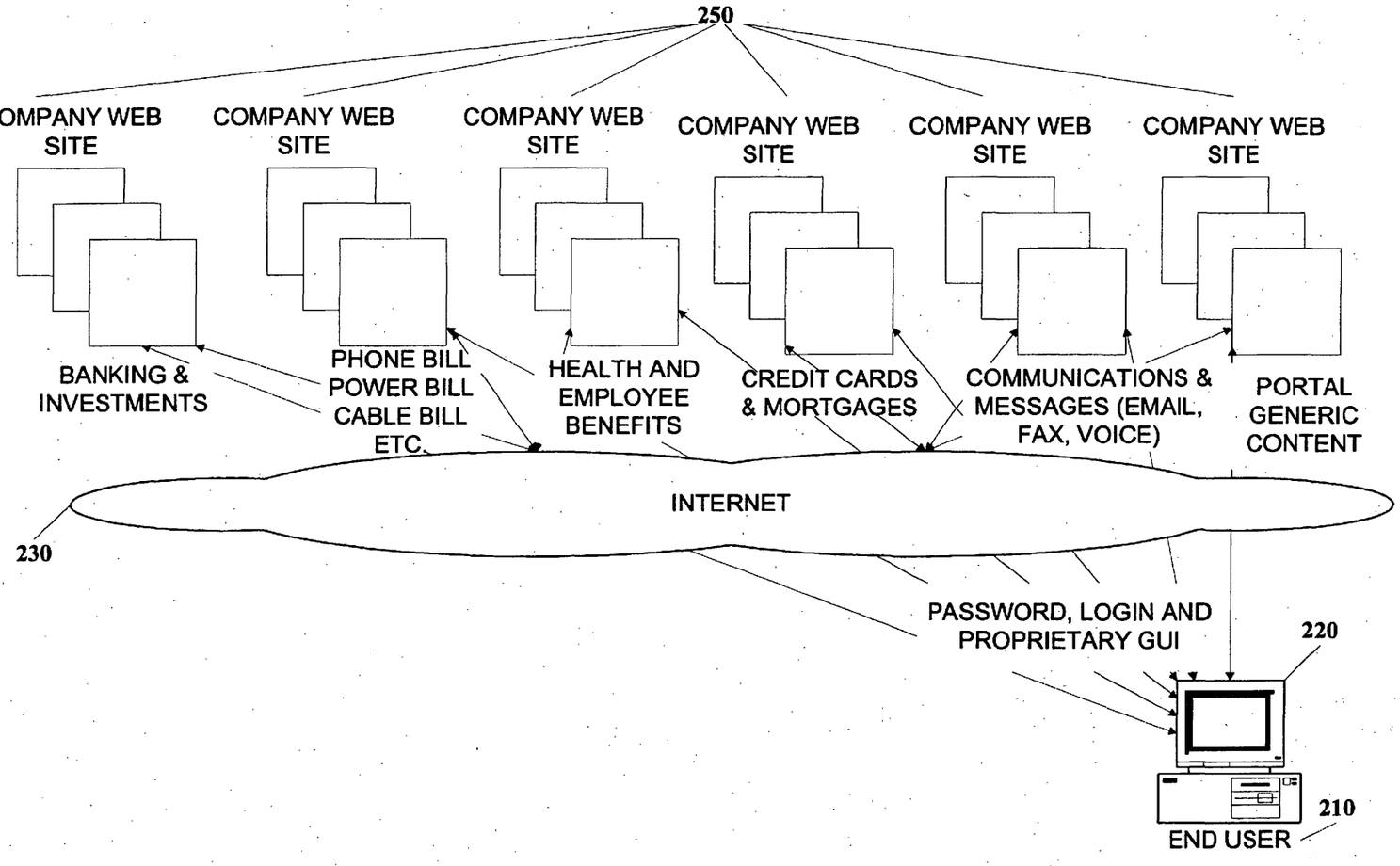

Site Monitor
370
Baseline Configure
320
End User
Configure
330
Provider
store
310
User Store
360
PI Access/Transact
340
PI Store
280
Individual
End User PI
375
PI Deliver
350

Figure 4
(Prior Art)



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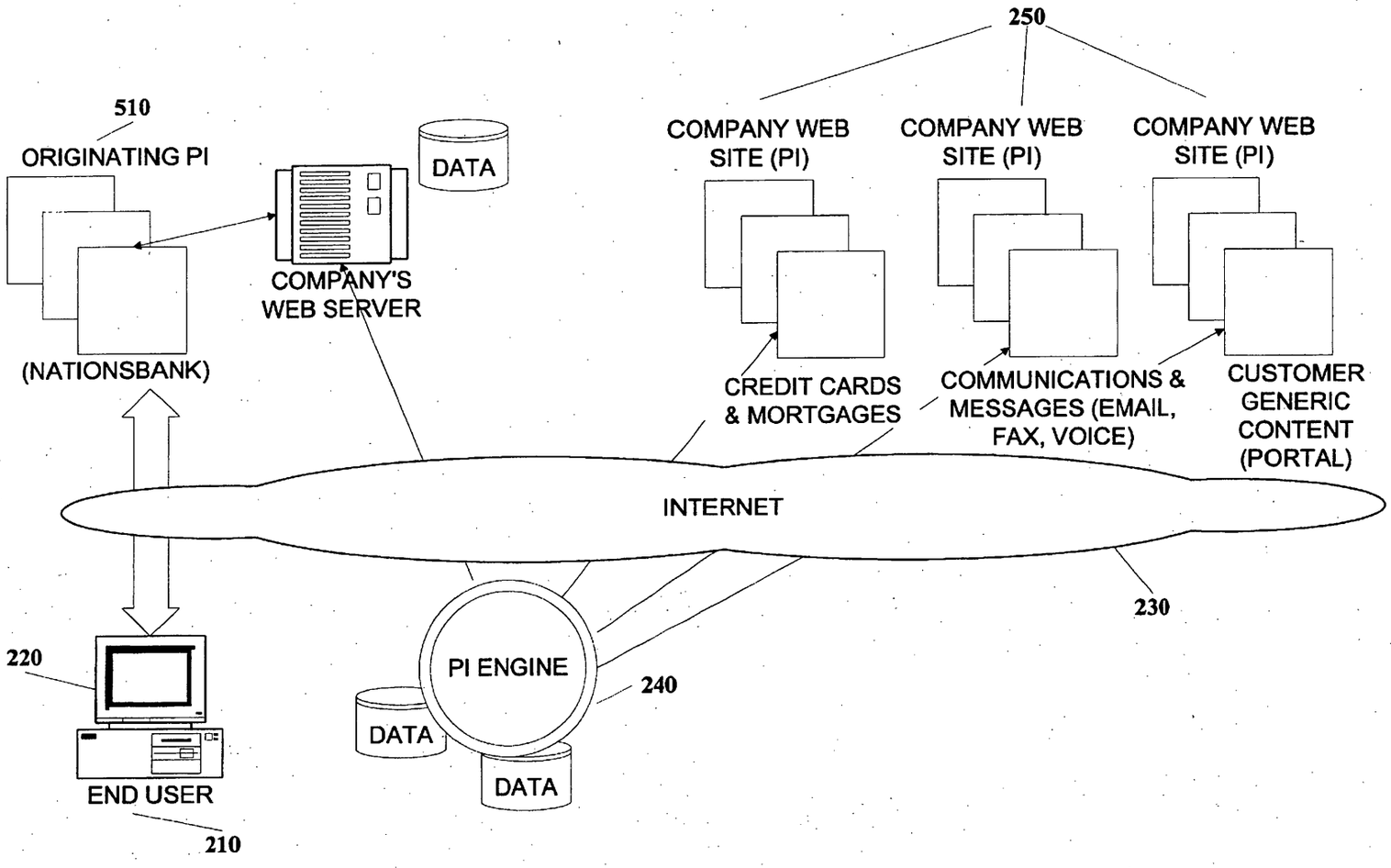

250
510
ORIGINATING PI
DATA
COMPANY WEB SITE (PI)
COMPANY WEB SITE (PI)
COMPANY WEB SITE (PI)
COMPANY'S WEB SERVER
(NATIONSBANK)
CREDIT CARDS & MORTGAGES
COMMUNICATIONS & MESSAGES (EMAIL, FAX, VOICE)
CUSTOMER GENERIC CONTENT (PORTAL)
INTERNET
230
220
PI ENGINE
240
DATA
DATA
END USER
210

Figure 6

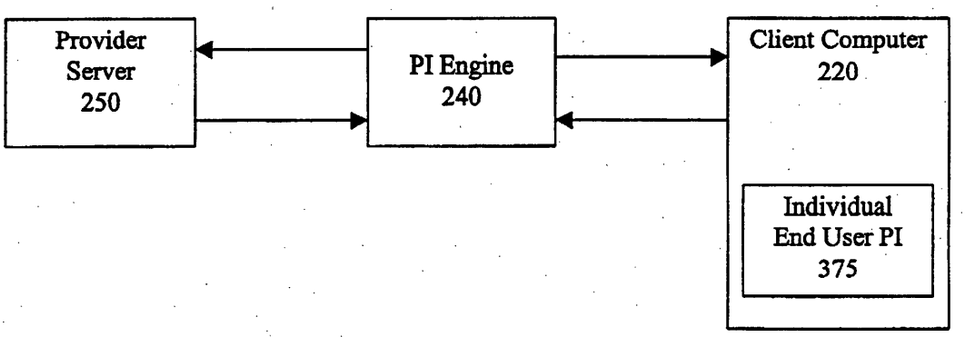

Provider
Server
250
PI Engine
240
Client Computer
220
Individual
End User PI
375

Figure 7

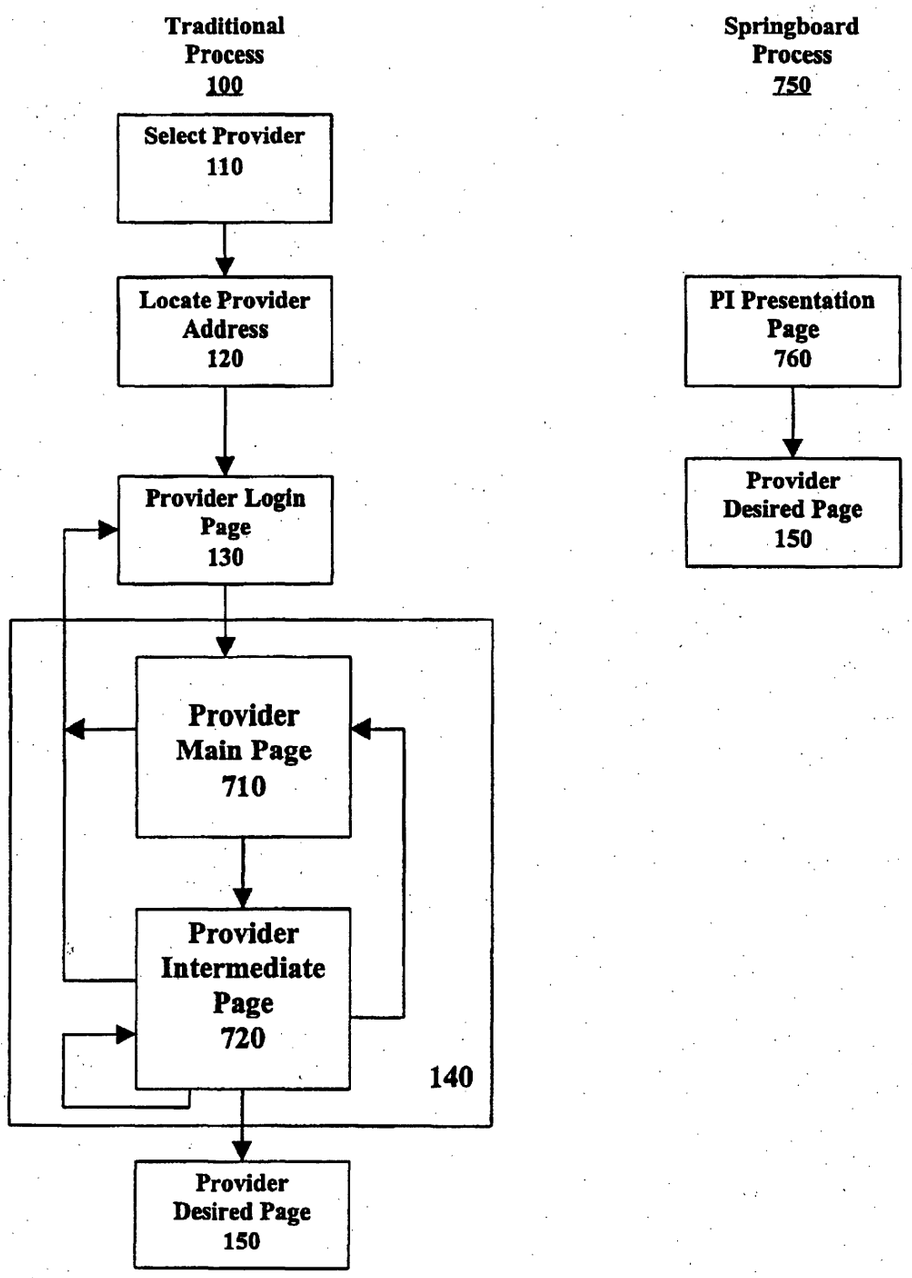

Traditional Process 100
Select Provider 110
Locate Provider Address 120
Provider Login Page 130
Provider Main Page 710
Provider Intermediate Page 720
140
Provider Desired Page 150
Springboard Process 750
PI Presentation Page 760
Provider Desired Page 150

Figure 8

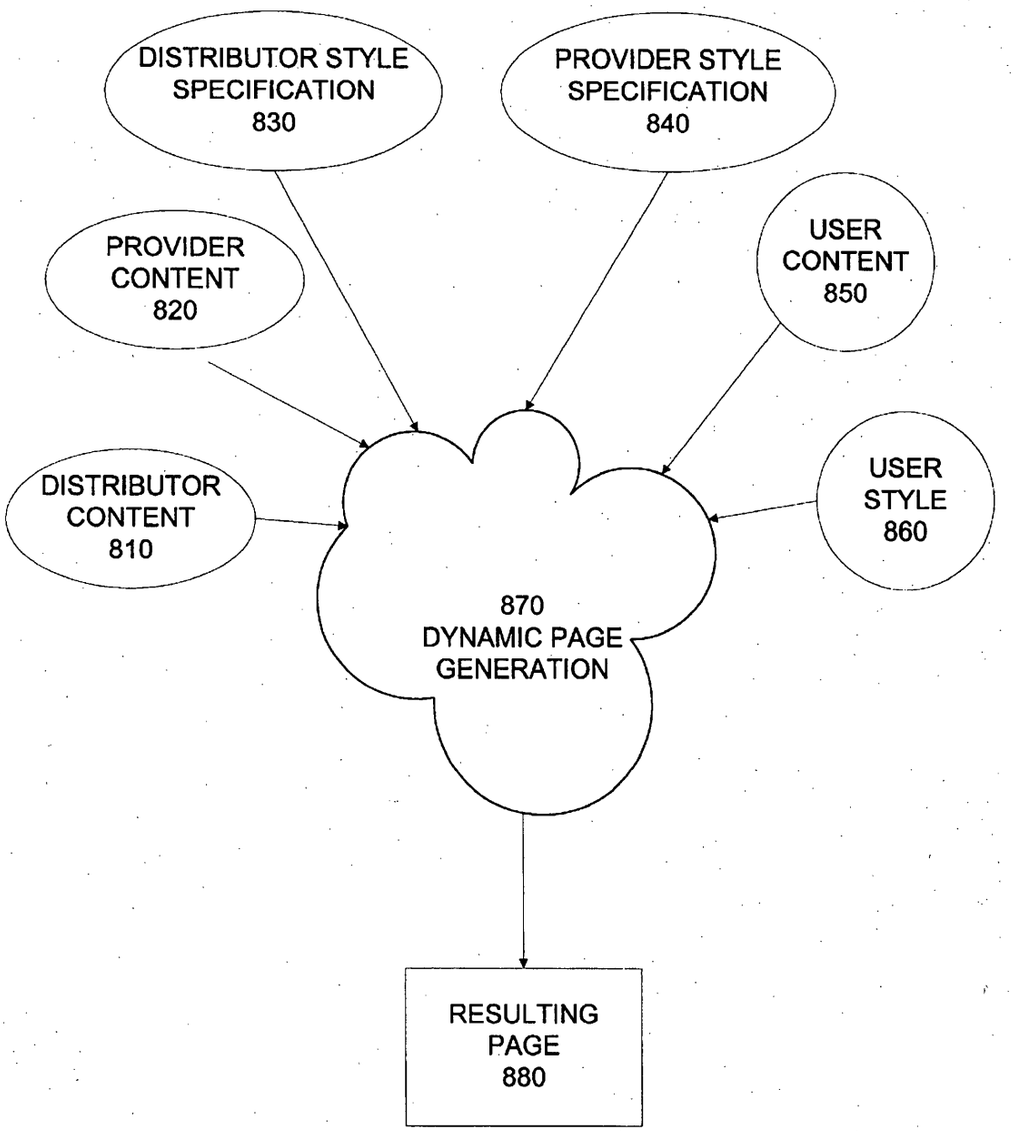
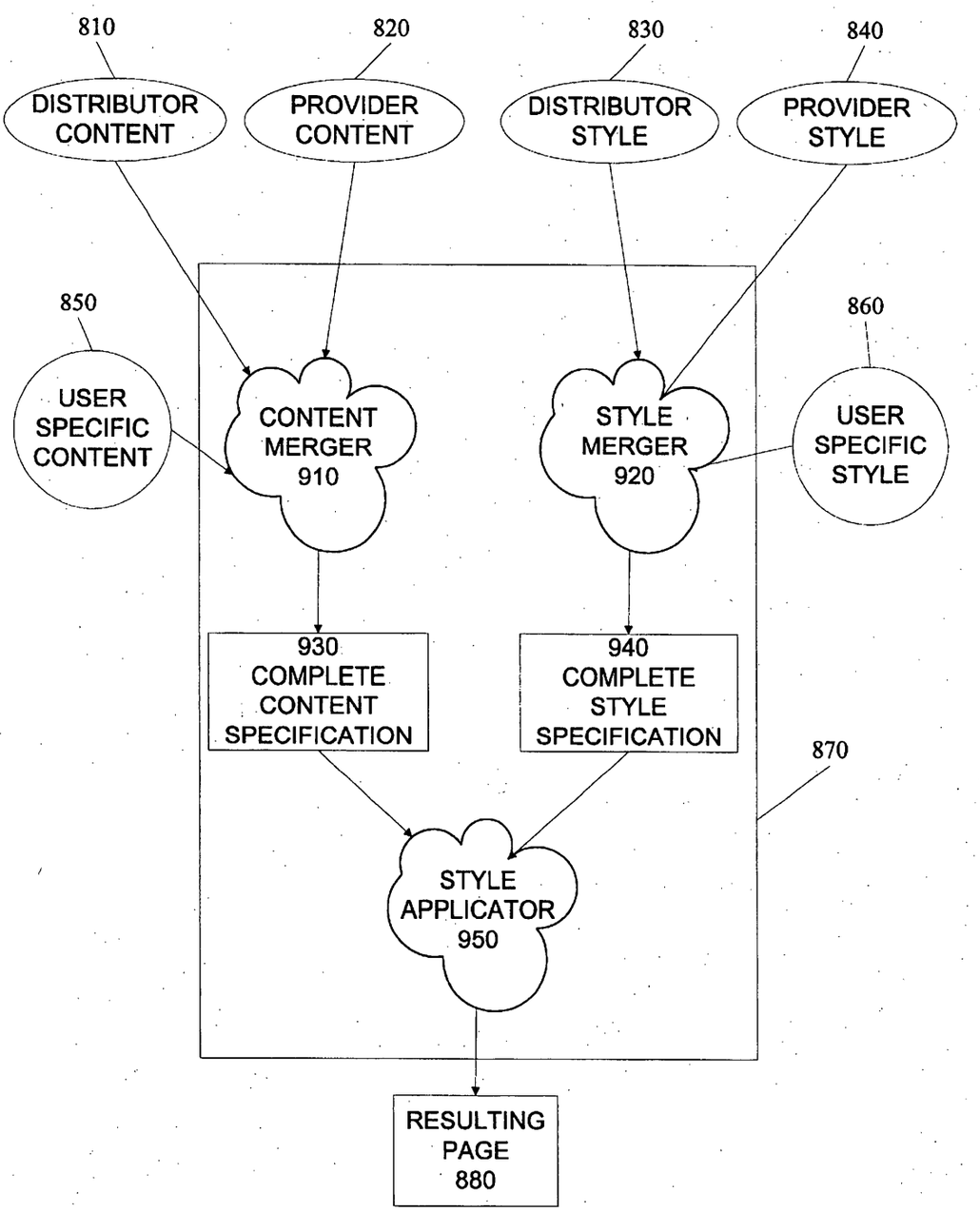

DISTRIBUTOR STYLE SPECIFICATION 830
PROVIDER STYLE SPECIFICATION 840
PROVIDER CONTENT 820
USER CONTENT 850
DISTRIBUTOR CONTENT 810
USER STYLE 860
870 DYNAMIC PAGE GENERATION
RESULTING PAGE 880

Figure 9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840
DISTRIBUTOR CONTENT
PROVIDER CONTENT
DISTRIBUTOR STYLE
PROVIDER STYLE
850
860
USER SPECIFIC CONTENT
CONTENT MERGER 910
STYLE MERGER 920
USER SPECIFIC STYLE
930 COMPLETE CONTENT SPECIFICATION
940 COMPLETE STYLE SPECIFICATION
870
STYLE APPLICATOR 950
RESULTING PAGE 880

Figure 10

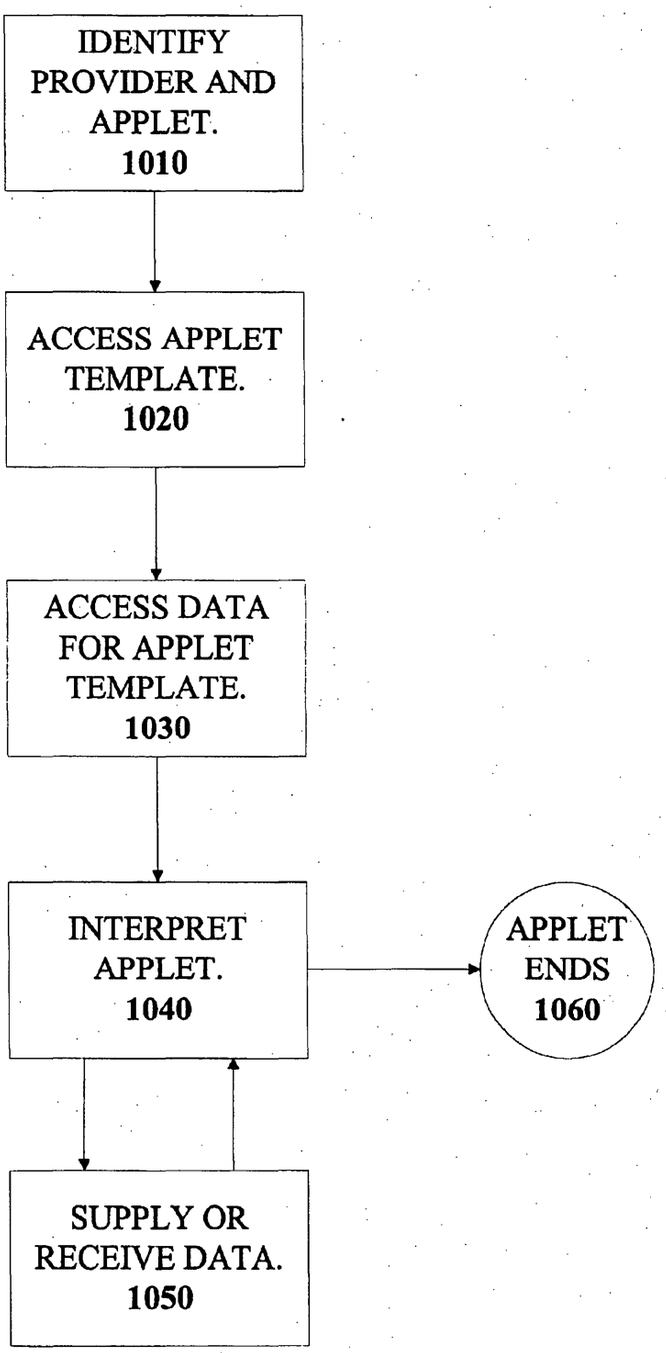
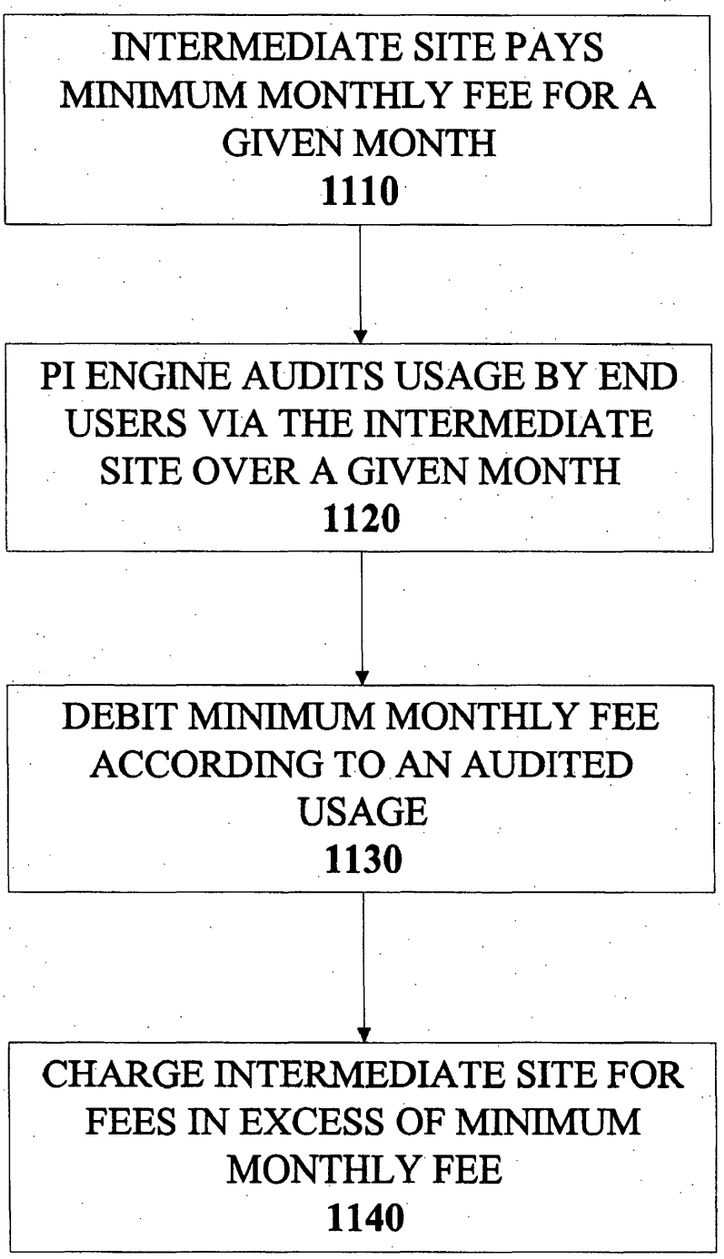

IDENTIFY PROVIDER AND APPLET. 1010
ACCESS APPLET TEMPLATE. 1020
ACCESS DATA FOR APPLET TEMPLATE. 1030
INTERPRET APPLET. 1040
APPLET ENDS 1060
SUPPLY OR RECEIVE DATA. 1050

Figure 11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PI ENGINE AUDITS USAGE BY END USERS VIA THE INTERMEDIATE SITE OVER A GIVEN MONTH
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DEBIT MINIMUM MONTHLY FEE ACCORDING TO AN AUDITED USAGE
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CHARGE INTERMEDIATE SITE FOR FEES IN EXCESS OF MINIMUM MONTHLY FEE
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APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

CROSS-REFERENCE TO RELATED PATENT APPLICATION

This application claims the benefit, pursuant to 35 U.S.C. §119(e), of applicants' provisional U.S. Patent Application Ser. No. 60/105,917, filed Oct. 28, 1998, entitled "Apparatus and Method for Automated Aggregation and Delivery of and Transactions Involving Electronic Personal Information or Data" and of applicants' provisional U.S. Patent Application Ser. No. 60/134,395, filed May 17, 1999, entitled "Apparatus and Method for Automated Aggregation and Delivery of and Transactions Involving Electronic Personal Information or Data".

BACKGROUND OF INVENTION

1. Field of Invention

The invention relates to an apparatus and process for automated aggregation and delivery of electronic personal information or data (PI). The invention further relates to the automation of transactions involving electronic PI.

2. Description of Related Art

Looking back over the last five years, it is apparent that as the Internet gained momentum, consumers demanded applications or services that make their online experience simpler, easier to use, and more satisfying. The development of successful Internet Sites has corresponded with a number of themes which have developed over the last few years. When carefully analyzed this evolution is a logical development of the emerging digital economy.

Prior to 1994, the Internet was not a mass media, in part, because the existing technologies (FTP, Archie, Usenet, and Gopher) were not user friendly and required the end user to do all of the work (e.g., the end user had to learn of an existing data source, find the address, navigate to the destination, and download the information). As more consumers began accessing the Internet, Search Engines were created to solve this usability issue. With the advent of the commercial Search Engine, additional content could be easily added to the Internet and the end user had a means of finding and accessing this information. Consumers required better tools than Search Engines for organizing and accessing this wealth of generic content. Push technologies were explored, and eventually, the portal strategy was successfully adopted as an efficient way for consumers to easily access a variety of content sources in a single, easy to use format. As the volume of available online content continues to grow exponentially, portals are now confronted with the need to make different types of content available to different consumers based upon their particular preferences and tastes.

The phenomenal success of Internet portals and destination sites has demonstrated the importance of creatively and intelligently aggregating, organizing and presenting the mass of information available on the Web. Search engines, portals and destination sites have Internet strategies based on the frequency, duration and quality of end user visits to their sites. For this reason, destination sites and portals are constantly seeking content and/or technologies which drive quality traffic to their site and keep it there. Recent trends indicate that Internet users are up to 25 times more likely to come back to a site when this information is organized according to personal preferences.

FIG. **1** displays the current process of acquiring online PI **100**. The end user first selects an information provider site in step **110**. The end user proceeds to step **120** by locating and entering the Internet address of the selected information provider. This step may be accomplished in several manners with varying levels of complexity. A simple means for accomplishing this step is the utilization of a bookmark or favorite whereas locating an information provider for the first time might involve significant time and effort performing online searches. In step **130**, the end users logs into the selected information provider's Web site utilizing the site's specific logon protocol. This protocol usually involves verifying the identity of the end user using a user name and password or other means of verification, acquiring the verification data from cookies residing on the end user's system or a combination of requested data and cookie data. The end user continues in step **140** by navigating through Web pages on the information provider's Web site until the desired information is located. During this process, the end user is often required to visit Web pages of little or no use to the end user whose goals is to simply acquire the particular PI residing on the Web site. Ultimately in step **150**, the end user is presented with the desired PI. The entire process **100** is repeated for each individual piece of PI desired by the end user. Under this PI access model, the end user must visit each separate information provider, track potentially different identity verification data for each, utilize a different user interface at each site and possibly wade through a significant number of filler Web pages.

FIG. **4** pictorial illustrates the architecture of this current access process. The end user **210** utilizes the client computer **220** to access each PI Web site **250** across the Internet **230**. This current model suffers from several significant deficiencies. The end user must login to each site separately. Each separate site has its own graphical user interface. Each site wants the end user to stay and return; each visited site wants to retain end user focus for as long as possible. No true aggregation of PI exists; multiple accesses simply allow sequential access to particular pieces of PI.

One partial solution to these problems has recently evolved in the form of portal sites. Generic portal sites aggregate resources into categories and provide links to sites covering topics within those categories. Yahoo and Excite are examples of generic portal sites. These sites facilitate horizontal aggregation of generic content; horizontal aggregation refers to aggregation of PI access within a particular information provider category such as banks or utility companies. Some portal site allows individual end users a limited capability to select and configure disparate generic PI. Generic PI refers to PI of interest to the particular end user that does not require specific identity verification to obtain. For example, an end user might be interested in the weather forecast for his local area. This information could be integrated into a portal page without requiring identity verification of the particular end user receiving this PI. The individualized portal page provides a significant benefit to users seeking to aggregate generic PI. However, current portal pages do not generally provide PI requiring identity verification such as an end user's stock portfolio or bank balance. Further, these pages do not facilitate transactions utilizing PI.

Under current technology, aggregating PI available over the Internet requires a significant burden in terms of time, effort and learning curve. An end user wishing to access his PI needs to individually visit a variety of information

provider sites each with its own requirements, graphical user interface and login protocol.

SUMMARY OF THE INVENTION

In the present invention, a networked computer is used to facilitate end user access of, manipulation of and transactions involving electronic PI associated with the particular end user such as stock portfolio, local weather, sports scores, bank account balances or other pertinent information or data. According to the present invention, the PI relevant to the particular end user is aggregated on the networked computer. This information or data is delivered to the end user in a unified manner by a variety of selectable delivery platforms such as facsimile, client computer, telephone, conventional mail, electronic mail, pager, other wireless device, Web page or channel or other delivery vehicle. The present invention further facilitates a variety of electronic transactions involving PI such as stock trading, retail purchases, bill payment, bank account fund transfers or other transactions.

A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor supports the aggregation of personal information. The processor selects an end user for personal information aggregation. Once the end user is selected, the processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

The above and other objects and advantages of the present invention will become more readily apparent when reference is made to the following description, taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a process diagram of the current process that end users perform to access Internet available PI.

FIG. **2** is a block diagram of the components that could be used to implement present invention.

FIG. **3** is a block diagram of the components of the PI engine.

FIG. **4** is a diagram of the current PI access architecture.

FIG. **5** is a diagram of an architecture supporting PI access utilizing an intermediary Web site.

FIG. **6** is a diagram of the cookie/client cache architecture.

FIG. **7** is a flowchart for accessing pages underlying particular PI via the traditional process of FIG. **1** and via springboard technology.

FIG. **8** depicts the integration model for the dynamic generation of HTML pages.

FIG. **9** displays the run-time process for dynamic generation of HTML page.

FIG. **10** illustrates a process for automated applet interaction utilizing a modified Java virtual machine.

FIG. **11** is a flowchart exemplifying an intermediary Web site transaction structure.

DETAILED DESCRIPTION OF THE INVENTION

A preferred embodiment of the invention is now described in detail. Referring to the drawings, like numbers indicate like parts throughout the views. As used in the description herein and throughout the claims that follow, the meaning of "a," "an," and "the" includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein and throughout the claims that follow, the meaning of "in" includes "in" and "on" unless the context clearly dictates otherwise.

In no time, end users will have to log into a large number of different Web Sites, each with separate passwords, security, rules, software and "look and feel"—just to get the information currently obtained by checking one place—the mailbox at the end of the driveway. The Internet will fundamentally change the way in which end users will access Personal Information (PI) and will make e-commerce as familiar as using an ATM. "Personal Information" is all of the data that companies, information providers, have that is specific or unique to each person such as monthly bills, bank account balances, investments information, health care benefits, email, voice and fax messages, **401**(*k*) holdings or potentially any other information pertinent to a particular end user.

The present invention alleviates several of the problems with the current PI acquisition methods by automatically aggregating PI, not only generic PI as aggregated by portals but also PI specific to the end user requiring identity verification for access. In one embodiment, the invention automates the PI acquisition and delivery process. FIG. **2** provides a block diagram of components that could be used to implement the present invention. The end user **210** accesses a client computer **220** running client software **270** which in a particular embodiment could be a general Web browser such as Navigator or Communicator (Netscape). The client computer **220** utilizes the Internet **230** to access a PI engine **240** running on a PI host **290**. The PI engine **240** examines stored PI **280** for freshness. Any stale PI items are refreshed by directly reacquiring the PI from the particular information provider's Web site **250** running on the provider's computer system **260** accessed across the Internet **230**. The PI engine **240** stores the fresh PI in its store **280** and delivers the PI to a selected destination, in this instance across the Internet **230** to the client computer **220** which displays the information to the end user **210** using the client software **270**. The PI engine **240** refreshes all stale PI in a like manner prior to forwarding the aggregated PI to both the store **280** and the delivery destination, the client computer **220** in this instance. The PI engine **240** may refresh the PI sequentially or in parallel. For example, the end user's checking account balance would be updated through his bank's Web site, his email from his particular email site, his portfolio information from his broker's site and his electricity bill from his electricity company's site.

FIG. **3** displays a block diagram of the components of the PI engine **240**. The PI engine **240** is composed of both storage and processing components. The three primary storage components are the PI store **280**, the PI Provider store **310** and the user store **360**. The first storage component of the PI engine **240** is the PI store **280**. The PI store **280** contains each individual's PI record **375**; the PI associated with a particular end user is segregated from the PI of all other end users. The PI engine also utilizes a provider store **310** that maintains general parameters associated with particular PI providers. The general parameters of a PI provider define the types of verification data necessary and the procedures to be followed to gain access to the particular PI provider. Each PI provider record also contains the types of PI provided by the PI provider and the types of transactions supported by the provider. Along with the type of PI or

transaction, the record also contains the additional types of data and procedures necessary to access the PI or execute the transaction. A user store **360** is also necessary to maintain configuration and verification information concerning particular end users. For each end user, the user selected PI providers, PI and transactions are registered along with the verification data necessary to acquire the PI or execute the transaction from the PI provider.

The PI store **280** may be implemented in a variety of ways. Referring to FIG. **2**, the PI store **280** may comprise a database residing on the PI Host **290**. Under this approach, the PI for each individual end user **210** is stored as a separate record or object **375** in the database. In yet another embodiment, the PI for each end user **210** could be stored in a separate file **375**, thus performing the task of segregating PI of different users at the file level.

In addition, or as an alternative, the PI associated with each end user **210** may reside on his/her client computer **220** using cookie technology as specified in D. Kristol and L. Montulli, "HTTP State Management Mechanism", Request For Comments (RFC) 2109, February, 1997 (available at http://www.ietf.org/rfc/rfc2109.txt), which is expressly incorporated herein in its entirety. The PI associate with the end user **210** would be stored as PI cookies **375**. This implementation mechanism provides inherent support for segregating PI associated with one end user **375** from PI associated with all other end users. Utilizing this method as a substitute for a centralized store provides a layer of security against unauthorized access. As a further measure, PI data stored in cookies could be stored in an encrypted format.

FIG. **6** provides a diagram of a typical implementation of the PI store **280** using cookie technology; references in the foregoing description are also made to FIG. **3** with respect to the internal workings of the PI engine **240**. When an attempt is made to access PI by an end user **210** directly, or through an intermediary Web server, the PI access/transact component **340** of the PI engine **240** would retrieve stored PI **375** from the PI store **280**. Under this approach, this stored PI **375** would be received directly from cookies sent by the client computer **220** of the end user **210**. The PI access/transact component **340** would perform any decryption if necessary. Any updates required would be obtained by direct access of PI providers **250**. The PI deliver component **350** would provide the mechanism for both updating the PI store **280** as well as transmitting the requested PI to the end user **210**, directly or through an intermediary Web site. The PI deliver component **350** would place the updated PI in the PI store **280** by replacing the outdated PI cookies **375** stored on the client computer **220**. The PI deliver component **350** would also handle any encryption if necessary. The PI deliver component **350** would also be responsible for transmitting requested PI. In a preferred embodiment, the PI store **280** would be implemented using this cookie-based architecture.

The user store **360** may be implemented in a variety of ways. Referring to FIG. **2**, the user store **360** may comprise a database residing on the PI Host **290**. Under this approach, the personal configuration data for each individual end user **210** is stored as a separate record or object in the database. In addition, or as an alternative, the end user data could be distributed in a manner similar to the cookie/cache architecture describe above with respect to the PI store **280**.

In a preferred embodiment, the user store **360** could be implemented through personal information configuration (PIC) files. PIC files store a personal profile such as name, address, and social security number in secure, encrypted fashion for each end user. PIC files facilitate automatic registration of end users with information Providers via the end user configuration component **330**. This component will read the PIC file and, using retrieved personal information, pre-populate registration templates for selected Providers. Then, it will prompt the user to enter required information that is missing from profile, if necessary. If the information is complete, the registration is automatically completed. Next, the end user configure component **330** completes any Provider registration forms, gets responses and updates the end user's PIC.

The four primary processing components access and manipulate the data in the three stores. The processing components may execute on a single processor, such as a file server computer system based on a Pentium class (MMX, PRO, II, III, etc.) central processing unit or an equivalent, or multiple processors. These four processing components are the Baseline configure component **320**, the end user configure component **330**, the PI access/transact component **340** and the PI delivery component **350** as seen in FIG. **3**. The Baseline configure component **320** provides the interface by which new user selectable PI providers are added to the system. This component **320** might be implemented in a variety of ways including trial and error followed by manual entry of configuration information, semi-automated trial and error (automated location of Hypertext Markup Language (HTML) <FORM> elements, Javascript functions and Java applets) followed by manual entry of configuration information or, preferably, configuration by example (executing the protocol in a simulated Web client where the simulated Web client automatically generates a list of required data and a list of steps in the access process). These processes would be utilized at two levels: the first level being the set of data and steps required for general access to the particular PI provider and the second level being the set of additional data and steps required for accessing each particular piece of PI on the PI provider's site. The baseline configuration component **320** may be triggered independently when a new PI provider is added to the system, or it might be triggered as a result of a failure of the PI access/transact component **340** potentially indicating a change in access requirements for the failed access. This latter warning would more likely result where the PI access/transact component **340** has made a comparison between requirements supplied by the Provider store **310**, both general to the PI provider and specific to the PI or transaction, and the end user data supplied by the user store **360** after seeking end user verification via a request of the end user to confirm the previously entered required access data via the end user configure component **330** and found an inconsistency. When an inconsistency is determined, updates to the Provider store **320** are made to bring the Provider data into conformance with current access/transaction requirements.

The end user configure component **330** allows an end user to select and configure PI and transactions of interest to the specific user. This configuration information is maintained in the user store **360**. When an end user initially subscribes to the system according to the present invention, the system allows the user to select the types and sources of PI and/or transactions desired. First, the system requests permission from the end user to act on his behalf to obtain any selected PI and to execute any authorized transactions. Next, the system provides the user with a list of known information suppliers and the types of PI supplied from and transactions supported by the particular PI provider from the Provider store **320**. The system requests the verification data neces-

sary for accessing each selected PI provider and the additional data required by the particular PIs and/or transactions desired from that PI provider. Assuming the end user is already a registered user with the selected PI provider or the particular PI provider does not require prior registration, the data supplied by the end user is placed in the user store **360**.

One method of obtaining any cookie data would be for the end user to access each previously accessed PI utilizing the PI engine **240** as a proxy server. The PI engine **240** would pass the cookie data to the PI provider site with the appropriate Web page requests to obtain the PI or execute the transaction and with the end user's permission retain a copy of the cookie data in the his record in the user store **360**. An alternate means of obtaining the cookie data would be a direct upload of the cookie information from the end user's computer. In a preferred embodiment, no cookie data is necessary where a user is already registered with a provider. All that is necessary is the verification data for login.

If the end user does not have the requisite information because he is not a registered user of a selected PI provider, the user configure component **330** prompts the user for the information necessary to register the end user with the PI provider and performs the registration procedure required by the PI provider. A simulated Web client could perform this process automatically supplying the access data as required and sending any necessary cookie data. The manner in which such a simulated client registers the end user depends significantly upon the interaction method used on the PI provider Web site. If the Web site uses HTML forms and common gateway interface (CGI) applications, the end user configure component **330** can formulate a uniform resource locator (URL) to replicate the effect of actual form usage and submit this URL to the simulated Web client. The use of a URL to mimic an HTML form is equivalent to manually entering the data into the Web <FORM> element. See Kerven, Foust, Zakour, *HTML* 3.2 *Plus How-To,* Waite Group Press, 1997, pp. 559–569. If the Web site uses a mixture of HTML forms and Javascript functions, a simulated Web client with a modified Javascript interpreter could effectively register the user by following the end user registration process for the particular PI provider. The registration process to follow would be obtained from the record of the particular PI provider in the Provider store **320**. The Javascript interpreter in the simulated Web client would follow this procedure and supply the data supplied by the end user. A similar process could be used if the registration process on the PI provider Web site utilizes a Java applet. A Web client with a modified Java bytecode interpreter could effectively register the user by following the end user registration process stored for the particular PI provider in the Provider store **320**. The bytecode interpreter would supply the data previously entered by the end user rather than requiring interactive input from the end user. If the PI provider Web site utilizes a combination of forms, scripts and applets, the individual procedures above could be used in combination to accomplish the desired registration.

With reference to FIG. **2** and FIG. **3**, a modification of the Java virtual machine (VM) could allow for automated interaction between the various functional components of the PI Engine **240** and Java applet available through provider Web servers **250**. Templates for interacting with particular applets could reside in the Provider store **310**. The specific input data utilized by such templates could be stored in the User store **360**. When a functional component such as the end user configure **330** or the access/transact **340** components requires automated communication with a Java applet on a provider Web server **250**, the modified Java VM would facilitate this interaction.

FIG. **10** illustrates one process utilizing such a modified Java VM to achieve such automated interaction. The functional component requiring interaction identifies the provider and the particular applet on that provider with which the component needs to interact in step **1010**. In step **1020**, the component accesses the necessary template for interacting with the applet from the Provider store **310**. Proceeding to step **1030**, the component accesses the User store **360** to obtain the data required by the template. The modified Java VM interprets the applet in step **1040** and, rather than requiring interactive input from a user as in a normal Java applet execution, awaits input from or output to the interacting functional component of the PI engine. In step **1050**, the functional component supplies input data to the modified Java VM according to the accessed template and retrieved data and receives output data according to the accessed template. Steps **1040** and **1050** repeat so long as additional input to or output from the applet continues. Upon termination of the applet, the functional component continues with its own processing in step **1060**.

A successful registration could result in displaying the registration information to the end user for future reference. Further, the end user configure component **330** stores the requisite access verification data for the PI provider and the additional data required to access the selected PI or transaction in the user store **360**.

In a preferred embodiment of such automated registration, any necessary cookie data would be accepted and stored as needed by the end user configure component **330**. In many cases, cookie data is session specific and, therefore, of little long term utility. Cookies generated during the registration process are used solely during the registration process then discarded once registration is complete.

A failed registration could result from several situations. First, the end user attempting to register with the PI provider does not qualify for registration; for example, an end user attempting to register with a bank with whom the end user does not maintain an account and where the bank only allows access to account holders. Next, the end user may have supplied improper or incorrect information. For example, a bank registration process might require a social security number, a password, a bank account number and the maiden name of the end user's mother; if the user entered an incorrect social security number, the registration process would fail. Finally, the PI provider may have altered the registration procedure for its Web site. In this situation, following the process supplied from the Provider store **320** would yield a failed registration. In the instance of any registration failure, the end user could be presented with the data initially supplied to the system for registration. The system could then ask the end user to double check the correctness of the information provided and to correct and resubmit the data if an error is found. A second failure resulting from the submission of identical requisite data might generate an error message presented to the end user stating that either the end user is ineligible to access the selected PI from the selected PI provider or that alteration by the PI provider may have caused an error in registration. This second failure could also trigger a warning suggesting the need to potentially reconfigure the record for the PI provider in the Provider store **320**.

Ultimately, the user store **360** would contain a record for each end user. This record as previous described could be a database entry, one or more cookies or a file such as a PIC file. Each record would identify the selected PI providers along with the general access verification data needed and also under each PI provider would be a list of PI supplied

and transactions supported by the particular PI provider of interest to the end user along with the additional data, if any, necessary to access that PI or execute that transaction. Specifically, duplicative information such as an end user's name would be centrally stored in the record once.

The end user configure component **330** also allows the end user to select one or more delivery destinations. One destination might be the end user's computer as exemplified by the client computer **220** running client software **270** in FIG. **2**; however, a computer is not the only destination contemplated by the present invention. The destination for PI delivery could include facsimile, electronic mail, telephone, conventional mail, pager, other wireless device such as a Palm Pilot (3 Corn), Web page or channel, Web browser or other delivery mechanism. The present invention also contemplates indirect access of PI by the end user utilizing a Web site as an intermediary; however, such indirect access would not require the end user to specify a delivery destination unless additional delivery options were desired.

Further, access to the end user configure component **330** may occur through direct access to the PI engine via the Internet as contemplated by the client computer **220** running client software **270** in FIG. **2**; however, alternative methods of access are equally feasible. For example, the user might indirectly access the PI engine through the use of an intermediary Web site. A telephone interface to allow access to the end user configure component is another alternative.

With reference to FIG. **3**, the PI access/transact component **340** supports the update, acquisition and transaction functionality of the PI engine **240**. The PI access/transact component **340** is responsible for accessing and storing user PI and executing transactions authorized by the end user. When access or update is needed for a selected end user, the PI access/transact component **340** combines information from the Provider store **320** and the user store **360** to update end user PI in the PI store **280**. For each piece of PI requiring access or update, the PI access/transact component **340** looks up the access procedure and information needed for the particular PI in the Provider store **320**. The verification and access data is found in the user store **360**. The PI access/transact component **340** utilizes this information to connect to the PI provider's Web site across the Internet and to access the PI. Where multiple pieces of PI require updating or access, the accesses may occur in series or parallel.

Requested transactions would be similarly supported. For each transaction, the PI access/transact component **340** combines information from the Provider store **320** and the user store **360** to perform the requested transaction. The PI access/transact component **340** looks up the transaction procedure and information needed for the particular transaction in the Provider store **320**. The verification and access data is found in the user store **360**. The PI access/transact component **340** utilizes this information to perform the transaction across the Internet from the PI provider's Web site

A simulated Web client could perform access or transaction processes automatically supplying access and verification data as necessary. The manner in which such a simulated client access PI or execute transactions depends significantly upon the interaction method used on the PI provider Web site. If the Web site uses HTML forms and common gateway interface (CGI) applications, the PI access/transact component **340** can formulate a uniform resource locator (URL) to replicate the effect of actual form usage and submit this URL to the simulated Web client. The use of a URL to mimic an HTML form is equivalent to manually entering the data into the Web <FORM> element. See Kerven, Foust, Zakour, *HTML* 3.2 *Plus How-To,* Waite Group Press, 1997, pp. 559–569. If the Web site uses a mixture of HTML forms and Javascript functions, a simulated Web client with a modified Javascript interpreter could effectively access the PI or perform the transaction by following the PI access/transact process for the particular PI or transaction respectively. The access or transaction process to follow would be obtained from the record of the particular PI or transaction in the Provider store **320**. The Javascript interpreter in the simulated Web client would follow this procedure and supply the data found in the user store **360**. A similar process could be used if the PI provider Web site utilizes a Java applet. A Web client with a modified Java bytecode interpreter could effectively access PI or perform transactions by following process stored for the particular PI or transaction in the Provider store **320**. The bytecode interpreter would supply the data from the user store **360** rather than requiring interactive input from the end user. If the PI provider Web site utilizes a combination of forms, scripts and applets, the individual procedures above could be used in combination to accomplish the desired access.

In a preferred embodiment of such automated accesses or transactions, any necessary cookie data would be accepted and stored as needed by the PI access/transact component **340**. In many cases, cookie data is session specific and, therefore, of little long term utility. Cookies generated are used solely during these functions then discarded once the mining or transaction operation is complete.

In order to provide personal information to an end-user quickly after login, it is necessary for the PI access/transact component **340** to select an end user for data harvesting prior to the login of the end user. One approach to this solution is to update all of an end user's PI whenever the end user, directly or through an intermediary Web site, requests access to his/her PI. Another approach would be to update all of an end user's PI supplied by a particular provider whenever PI from that supplier is requested. Thus, the act of logging into the system by an end user effectively selects that end user for immediate PI update. However, this approach may result in the inefficient use of the PI Engine **240** resources.

Given the large number of potential users and providers, and the goal of providing the freshest data possible, another embodiment includes an algorithm developed to optimize the schedule in which end users are selected for data harvesting from a provider. This algorithm factors in the provider's update policy, the user's login habits, and the user-provider account characteristics. The proper application of the algorithm should ensure that PI is harvested as infrequently as possible for a given user, thus minimizing system resource consumption.

If the next provider update time and the next expected user login can be accurately predicted, a model can be created that will allow for smarter harvesting. Rather than harvesting data for all users of a provider at once when the provider updates its site, the harvesting can be spread out over time based on expected login times of users and network activity profiles. For example, if Provider A updates its site on Friday night and a large number of users of that provider are not expected to login again until Monday morning, the harvesting load can be distributed across multiple days. This has the advantage of minimizing both the peak loading of the PI Engine **240** as well as consumption of the provider's bandwidth by the PI Engine **240**. To gain this optimization, the PI Engine **240** must maintain and

refine models of each provider and user. Such data can be maintained in the provider store **310** and the user store **360** respectively.

Each time a user utilizes the PI Engine **240**, the time and date may be captured. Once a sufficient number of login times are accumulated, they may be analyzed with respect to day of month, day of week, and time of day. These are used in a model to predict the next expected user login. The model is then tested and refined with subsequent logins until a measurable degree of confidence is established. Once high confidence is determined, the user model is incorporated into the adaptive harvesting scheduler. Until a high confidence level is reached for a particular end user one of the aforementioned harvesting approaches may be used.

Each provider updates its site based on policy driven by their unique resources and business model. For any adaptive scheduler to work, the policy for each provider must be modeled. In some cases, the policy is self-evident. In others, it must be determined empirically. A provider's policy will most likely fall into one of the following categories:

Type I. Updated periodically for all users

Type II. Updated periodically relative to each user

Type III. Updated in a pseudo-random manner

The following three approaches may be used based upon provider type.

Type I Provider Policy Scheduling Algorithm

1. Assume users with a "no confidence" model have an immediate login time.
2. Order the users chronologically based on their predicted login time.
3. Shift the expected login time for all users back one hour.
4. Perform a density curve fit along temporal boundaries to get a polynomial function that can be used to determine the number of user accounts to harvest for a given epoch.
5. Perform an integral matching algorithm with the inverse of the network activity curve for the time period in question to adjust the distribution curve.
6. If possible, re-distribute peak harvesting time toward time zero to flatten the distribution curve.
7. Assign harvesting times to the sorted users according to the distribution curve.
8. Monitor time and harvest the user account when appropriate.

Type II Provider Policy Scheduling Algorithm

For each provider that falls into this category, an attribute of the user must be identified that determines when the personal information is updated. In some cases, the user may need to be queried for the information. In others, it can be determined from the harvested information. If the attribute cannot be established for a user via either of these means, the provider site may be monitored daily for changes in personal information until a pattern is established.

Since there is a natural, even distribution of accounts updated by a provider for a given day, a user's account can be harvested an hour before his expected login time. As in the Type I algorithm, users with a "no confidence" model should be immediately harvested.

Type III Provider Policy Scheduling Algorithm

This type of policy is the most difficult of all. Since the provider updates a user's account in a non-deterministic manner, a decision must be made for each provider as to the criticality of the information relative to the user. For those highly critical providers, each user account should be harvested daily, perhaps even more frequently. For those less critical providers, user accounts should be harvested less frequently and possible when overall system activity is low.

The PI deliver component **350** is responsible for formatting and delivering the PI to the end user. Usually delivery will only occur subsequent to updating all stale PI. The PI will be delivered to one or more destinations (e.g. facsimile, telephone, pager, Web browser, e-mail, etc.) as specified in the user store **360** except where the PI is accessed via an intermediary Web site. Where the destination is not an intermediary Web site, the PI deliver component **350** performs all formatting necessary to deliver the PI to the appropriate destinations. For example, where the destination is a Web browser, the PI would be formatted as an HTML document, or where the destination is a telephone, the PI would be submitted for voice synthesis and transmission.

In the case of an intermediary Web site, the PI is delivered in a format configurable by the intermediary Web site. FIG. **5** pictorial illustrates a possible embodiment of the current invention utilizing an intermediary Web site. An end user **210** utilizes a client computer **220** to access an intermediary Web site **510** across the Internet **230**. The end user **210** logs into the intermediary Web site **510**. The intermediary Web site **510** contacts the PI engine **240** across the Internet **230** and directly receives the end user's PI updated as required from the PI provider Web sites **250**. The intermediary Web site **510** receives the PI, incorporates it into pages according to its particular formatting style and graphical user interface and delivers these pages to the end user **210**. The use of the PI engine **240** is transparent to the end user **210**. Further, an intermediary Web site **510** serving aggregate PI to an end user **210** may, and most likely will, simultaneously serve as a PI provider.

In another embodiment, this formatting occurs via a dynamic HTML generation system combining stylistic and layout information from a variety of sources. The PI deliver component **350** generates custom HTML pages dynamically. These pages are customized based on a number of stylistic factors (such as background color, foreground color, font size, color and style, page layout, etc) from a variety of sources and content from a variety of sources. Information providers, distributors, the end user, the PI deliver component **350** or any combination of these sources, or other relevant sources, may provide customization factors used in the page generation. Finally, each HTML page must be filled in with data. The data used in such pages may originate from such sources as information providers, distributors, the end user, the PI deliver component **350** or any combination of these sources, or other relevant sources. The required solution is a system representing a generic algorithm for performing such HTML generation at run-time. The style and content may be provided in any suitable format such as the Extensible Stylesheet Language (XSL), as specified by W3C in http://www.w3.org/TR/WD-xsl/, which is expressly incorporated herein by reference in its entirety, and/or the Extensible Markup Language (XML) as specified by W3C in http://www.w3.org/TR/REC-xml, which is expressly incorporated herein by reference in its entirety, or other suitable formatting standard. The key requirements for such a system are complete encapsulation of the problem domain and run-time efficiency.

In preferred embodiments, the solution is based on the following basic model as depicted in FIG. **8**:

1. Six sets of customization factors are identified: distributor content **810**, provider content **820**, distributor style specification **830**, provider style specification **840**, user-specific content **850** and user-specific style **860**.
2. Each set of customization factors **810–860** is considered a separate, independent and required input to the run-time system **870** that performs dynamic page generation.
3. Each input **810–860** will be in form of an XML stream.

4. Output **880** will be in form of an HTML stream.
5. The dynamic page generation system **870** will produce valid output **880** for each set of six valid inputs **810–860**.

FIG. **9** illustrates an actual run-time sequence of input processing by such a system **870**:

1. Distributor content **810** is combined with provider content **820** and with user-specific content **850** to produce a complete content specification **930** by the content merger unit **910**.
2. Distributor style **830** is combined with provider style **840** and with user-specific style **860** to produce a complete style specification **940** by the style merger unit **920**.
3. The style specification **940** is applied by the style applicator **950** to content specification **930** in order to produce the resulting page **880**.

In order to completely encapsulate the problem domain, the following requirements must be placed on the system **870**:

1. Each XML input **810–860** is a valid XML stream.
2. All content specifications **810**, **820** and **850** are valid with respect to the same Document Type Definition.
3. All style specifications **830**, **840** and **860** are valid with respect to the same Document Type Definition (such as the XSL DTD standard).
4. The merging units **910** and **920** whose task is to take two or more XML streams and produce a combined XML output must be able to produce such output for any set of valid XML inputs.

Another method of performing this task would be to format PI as HTML elements with predefined CLASS attributes. The intermediary Web site receiving these elements could dynamically include them in page forwarded to the end user of the PI. The pages incorporating such elements could include different style information associated with the predefined CLASS set. Level 1 cascading style sheet convention could be used to implement such configurability. See Kerven, Foust, Zakour, *HTML* 3.2 *Plus How-To,* Waite Group Press, 1997, pp. 651–693; Walsh, "An Introduction to Cascading Style Sheets," *World Wide Web Journal,* Winter 1997, pp. 147–156. This option requires minimal programmatic support by the intermediary Web site but restricts to some degree the intermediary Web sites flexibility in presenting the PI to the end user.

Alternatively, an intermediary Web site could develop an application utilizing a standardized application programming interface (API) to directly access the PI data. In this instance, the PI deliver component **350** could either be bypassed or potentially used as the component responsible for servicing API requests for data. Under this model, the intermediary Web site would be responsible for all formatting decisions with respect to the raw PI data. This implementation option requires additional programmatic support by the intermediary Web site but allows for greater flexibility in the use of the raw PI.

The ability to utilize an intermediate Web site to deliver PI is of significant utility. This capability allows an end user already familiar with an existing PI provider to access not only the PI associated with the particular PI provider but also all PI from other PI providers in the comfort of a familiar user interface, namely the existing PI provider Web site. In this situation, the request for PI would directly originate with the intermediary PI provider Web site and indirectly from the end user. Security measures would restrict access to authorized intermediate Web site access. These measure might include verification of the end user and the intermediate Web site. Further, verification of the association between the end user and the particular intermediate Web site might also be required for additional security.

In addition, the use of an intermediary Web site also supports a novel transaction model. In this transaction model, the intermediary site subsidizes, or fully compensates, the PI engine administrator for services provided to the end user. These transactions are facilitated via the auditing and tracking capabilities of the PI engine. These capabilities allow the calculation of per user fees, per transaction fees, per access fees or some combination thereof to be assessed. The assessed values could be directly charged to the intermediary Web site. Alternatively, such values could be debited from a minimum monthly fee charged to the intermediary Web site with any fees beyond the minimum charged directly to the intermediary Web site.

FIG. **11** depicts a flowchart of a typical process according to the described model. The intermediary Web site pays a minimum monthly fee in step **1110**. In step **1120**, the PI engine audits and tracks end user usage via the intermediary Web site. The audited usage is used to assess a fee on a per user, per access, per transaction or combination basis. In step **1130**, this audited amount is debited from the fee paid in step **1110**. In step **1140**, the intermediary Web site is charged for any fees in excess of the minimum fee paid.

Often an end user may require access to the underlying Web page generated by the provider of a particular piece of PI. The delivery component may deliver not only the PI but also an access point directly to the provider's page supplying that PI. The access point may take the form of a link, a form button or some other interactive access mechanism.

Such an access point significantly improves the efficiency of accessing the underlying page by the end user as exhibited by FIG. **7**. In the traditional process **100** for accessing PI, the end user must proceed through numerous intermediary pages requiring a variety of often tedious interactions before reaching the desired page.

The end user must first identify the Provider **110**. Next, the end user must locate the Provider's Web address **120**. Then, the user the requests the Provider's login page **130**. If the end user does not remember the requisite information, this information must be found, or the desired information will remain inaccessible via the Web. The end user then navigates the Provider's Web site **140**. This often entails visiting the Provider's main page **710** followed by viewing a variety of intermediate pages on the Provider's site **720**. The end user may have to backtrack several times to the main page **710** or accidentally leave the system entirely forcing a second login **140** before finally locating the desired information **150**.

Utilizing springboard technology, the entire process **750** is streamlined into the single click of an access point. The delivery component of the PI Engine delivers an access point to the Provider's underlying page along with the PI. As a consequence, the end user need only perform a single interaction with the PI presentation page **760**. This interaction immediately performs the requisite interactions with the Provider's Web site to bring the user to the desired underlying Web page **150**.

In one embodiment, this springboard technology could be implemented utilizing a Java applet. With respect to FIG. **2**, the applet would be downloaded from the PI Host **290** by the end user's client software **270**, usually a Web browser, and executed locally by the end user's computer **220**. The applet would drive the client software **270** to the desired page. Such an applet could retrieve procedures and data for driving the client software from the Provider store **310** and the User store**360**.

In a further embodiment, the PI engine **240** could act as a proxy server directly accessing the Provider store **310** and the User store **360** as required. When the PI engine **240** receives the request to jump to the source of a particular piece of PI, the engine performs the necessary actions to navigate to the desire page and forwards the desired page to the end user's computer **220**. Further interactions with the page might require additional proxying by the PI engine **240** as accumulated cookie data may reside on the PI Host **290**. This embodiment is limited to use in handling standard HTTP traffic rather than secure HTTP traffic.

In a preferred embodiment, the springboard provides the end user with automated login into the PI Provider site **250** and allows the end user **210** to navigate via the client software **270**. This automated login could be accomplished through the utilization of a hypertext transfer protocol (HTTP) redirect. Upon receiving the a springboard access request from the end user **210** via the client software **270**, the PI Host **290** requests the login page from the PI Provider site **250** targeted by the springboard access. The PI engine **240** running on the PI Host **290** receives this login page and constructs a login request by accessing the proper data in the Provider store **310** and the User store **360**. The login request is embedded in the HTTP redirect which is forward to the client software **270**. The client software **270** is redirected to the targeted PI Provider site **250**, and the end user **210** is automatically logged into this site.

Alternatively, this functionality could be implemented via a Java applet as described above. In addition, the PI engine **240** could generate a Javascript page containing the pertinent login request rather than an HTTP redirect. The Javascript page could be returned to the client software **270**. This page would then be executed by the client software **270** to accomplish the automated login.

The PI engine **240** of FIG. **3** may also include a site monitor **370** processing component. This component would systematically monitor supported PI provider Web sites for changes. This component enhances the ability of the system to identify alterations in PI provider Web site procedures, data requirements and cookies requirements. This component increases system efficiency by supplementing or supplanting alteration identification via feedback from the PI access/transact component **340**.

A further embodiment of the present invention might support the localize manipulation of PI. This could be accomplished where the client software **270** running on the client computer **220** in FIG. **2** is a specialized Web client rather than a general Web client such as Netscape. This specialized client might utilize Web channel technology to automate the local PI download and update processes. Where the PI store is implemented via the aforementioned cookie architecture, this specialized client may provide direct local access to stored PI.

In another embodiment, the PI engine **240** of FIG. **3** might support both system supported PI providers as well as PI providers specific to particular end users. In this embodiment, an end user is not limited to PI available from PI providers present in the Provider store **310**. For an end user to add PI provided by a non-supported PI provider, the end user would access the Baseline configure component **320** and create a configuration for the non-supported PI provider. The PI provider and PI configuration along with the verification and access data would be stored along with the user's record in the user store **360**.

A further embodiment of the present invention supports the inclusion of PI transaction procedures and access requirements in the Provider store **310** of FIG. **3**. The end user specific information necessary to realize such a transaction would reside with the user record in the user store **360**. The functionality of the PI access/transact component **340** would expand to support the performance of transactions. This additional functionality could be supported in a manner similar to the procedure described above with respect to performance of access utilizing a simulated Web client. A further feature of this embodiment would include automated or semi-automated account management by providing trigger events to automatically initiate a transaction.

For instance, with reference to FIG. **2** an end user **210** would be able to maintain his/her accounts online through the PI Engine **240**. If an information provider has the capability of receiving payments online, the PI Engine **240** could support complete or partial automation of such transactions. If there is a billing due date for a certain information provider, PI Engine **240** could flag that information and send email to the end user **210** notifying him/her of the bill due. Thus, the user will not have to check each of his/her providers individually for due date information. The PI Engine **240** could also automated payments on a limited range of billing amount for providers who allow payments over their Web servers **260**, then send an email to the user with the notification of payment.

Due date acquisition could be accomplished utilizing the PI access/transact component **340** seen in FIG. **3**. The due date information would be available to the end user via any delivery means supported by the PI deliver component **350**. The PI access/transact component **340** would use standard e-commerce bill-paying methods to pay the user's bill/s to the provider if he/she chooses. Once the bill is paid, then an email notification will be sent to the user with the provider information and payment information. The user can specify the range of amount stored in the user store **360** that will be paid automatically. If the bill exceeds the amount specified by the user, then PI engine will simply send out an email notification to the user instead of paying the bill automatically.

The embodiments described above are given as illustrative examples only. It will be readily appreciated that many deviations may be made from the specific embodiment disclosed in this specification without departing from the invention. Accordingly, the scope of the invention is to be determined by the claims below rather than being limited to the specifically described embodiments above.

What is claimed is:

1. A method for delivering non-public personal information relating to an end user via a wide-area computer network to an end user from at least one of a plurality of information providers securely storing the personal information under control of a processor located remotely from the information providers and the end user, the method comprising the steps of:

(a) the processor connecting with at least one information provider;

(b) for a selected end user, the processor retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers, the end user data including information identifying the plurality of information providers securely storing the personal information relating to the end user, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor

using the protocol also being accessible by the end user via the network independently of the system for delivering personal information; and

(c) the processor storing the retrieved personal information in a personal information store for access by the selected end user.

2. The method of claim **1**, further comprising the step of monitoring information providers for changes.

3. The method of claim **1**, further comprising the step of updating the provider store to conform with requirements of the information provider.

4. The method of claim **1**, further comprising the step of executing a transaction for the selected end user with a selected information provider based on the accessed end user and the accessed information provider data associated with the selected information provider.

5. The method of claim **4**, wherein the execution step is triggered according to the accessed end user data.

6. The method of claim **1**, further comprising the step of outputting the personal information associated with the selected end user from the personal information store.

7. The method of claim **6**, wherein the outputting step outputs the personal information to a delivery platform specified in the accessed end user data.

8. The method of claim **7**, wherein the specified delivery platform is selected from the group consisting of electronic mail, facsimile, pager, telephone, wireless device, ftp server, Web server, gopher server and Web client.

9. The method of claim **6**, wherein the outputting step outputs the personal information via a world wide web site.

10. The method of claim **9**, wherein the outputting step outputs personal information as a formatted Web page to the world wide web site.

11. The method of claim **9**, wherein the outputting step outputs personal information as formatted Web elements to the world wide web site.

12. The method of claim **9**, wherein the outputting step outputs personal information data to the world wide web site.

13. The method of claim **1**, wherein the connecting step comprises the substeps of:

(i) accessing the end user data associated with the selected end user;

(ii) identifying information providers specified in the accessed end user data; and

(iii) establishing a communication link with each of the identified information providers.

14. The method of claim **1**, further comprising the step of outputting the retrieved personal infonmation to an intermediary web site, wherein the intermediary web site has an associated user interface format.

15. The method of claim **14**, wherein the retrieved personal information is output to the intermediary web site in a format other than the format associated with the intermediary web site.

16. The method of claim **14**, wherein the intermediary web site outputs the retrieved personal information to a web client, and the web client displays the retrieved personal infonmation.

17. The method of claim **16**, wherein the web client displays the retrieved personal information in the format associated with the intermediary web site.

18. A computer-readable, digital storage device storing executable instructions which cause a processor to deliver non-public personal information relating to an end user from at least one of a plurality of information providers securely storing the personal information to the end user via a wide-area computer network by performing the steps comprising of:

(a) connecting with at least one information provider;

(b) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers, the end user data including information identifying the plurality of information providers securely storing the personal information relating to the end user, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information; and

(c) storing the retrieved personal information in a personal information store.

19. The storage device of claim **18**, further storing executable instructions to perform the connecting step by performing substeps comprising of:

(i) accessing the end user data associated with the selected end user;

(ii) identifying information providers specified in the accessed end user data; and

(iii) establishing a communication link with each of the identified information providers.

20. A system for delivering non-public personal information relating to an end user via a network from at least one of a plurality of information providers, the information providers securely storing the personal information, the system comprising:

(a) a user store for storing end user data associated with each end user, the user store including information identifying the plurality of information providers securely storing the personal information relating to the end user;

(b) a provider store for storing information provider data associated with each information provider, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information;

(c) a personal information store for storing personal information associated with each end user retrieved from the information providers;

(d) a processor in communication with the user store, the provider store and the personal information store, for performing the steps of:

(i) connecting with at least one information provider;

(ii) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers; and

(iii) storing the retrieved personal information in the personal information store for accessible to the selected end user.

21. The system of claim **20**, wherein the processor performs the additional step of monitoring information providers for changes.

22. The system of claim **20**, wherein the processor performs the additional step of updating the provider store to conform with requirements of the information provider.

23. The system of claim 20, wherein the processor performs the additional step of executing a transaction for the selected end user with a selected information provider based on the end user data associated with the selected end user and the information provider data associated with the selected information provider.

24. The system of claim 23, wherein the processor automatically performs the transaction execution step according to end user data in the user store.

25. The system of claim 20, wherein the processor performs the additional step of outputting the personal information associated with the selected end user from the personal information store.

26. The system of claim 25, wherein the outputting step performed by the processor outputs the personal information to a delivery platform specified in the end user data associated with the selected end user.

27. The system of claim 26, wherein the specified delivery platform is selected from the group consisting of electronic mail, facsimile, pager, telephone, wireless device, ftp server, Web server, gopher server and Web client.

28. The system of claim 25, wherein the outputting step of the processor outputs the personal information via a world wide web site.

29. The system of claim 28, wherein the outputting step of the processor outputs personal information as a formatted Web page to the world wide web site.

30. The system of claim 28, wherein the outputting step of the processor outputs personal information as formatted Web elements to the world wide web site.

31. The system of claim 28, wherein the outputting step outputs personal information data to the world wide web site.

32. The system of claim 20, wherein the connecting step of the processor performs the following substeps:

(A) accessing the end user data associated with the selected end user;

(B) identifying information providers specified in the accessed end user data; and

(C) establishing a communication link with each of the identified information providers.

33. The system of claim 20, further including an intermediary web site having an associated user interface format, wherein the processor performs the additional step of outputting the retrieved personal information to the intermediary web site.

34. The system of claim 33, wherein the retrieved personal information is output by the processor to the intermediary web site in a format other than the format associated with the intermediary web site.

35. The system of claim 33, further including a web client, wherein the intermediary web site outputs the retrieved personal information to the web client, and the web client displays the retrieved personal information.

36. The system of claim 35, wherein the web client displays the retrieved personal information in the format associated with the intermediary web site.

* * * * *

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/428,511	10/27/99	~~709~~ 709/218	~~2755~~ 2154	22022.0003

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371 (NAT'L STAGE) DATA********
VERIFIED

None IIIC

FOREIGN APPLICATIONS********
VERIFIED

None IIIC

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Foreign Priority claimed 35 USC 119 (a-d) conditions met	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
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Verified and Acknowledged IIIC (Examiner's Initials) _____ (Initials)				

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TITLE

APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

FILING FEE RECEIVED	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT NO. _____ for the following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

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October 27, 1999

Dear Sir:

Transmitted herewith for filing are the specification and claims of the patent application of:

Inventor(s): GREGG FREISHTAT and PALANISWAMY RAJAN

Title of Invention: APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

Also enclosed are:

11	SHEETS OF	[] FORMAL DRAWINGS	[X] INFORMAL DRAWINGS
	OATH OR DECLARATION OF APPLICANT(S)		
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	A PRELIMINARY AMENDMENT		
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	A computer readable form of the sequence listing in compliance with 37 C.F.R. § 1.821(e). The content of the computer readable form of the sequence listing and the sequence listing in the specification of the application as filed are the same.		
	OTHER (IDENTIFY)		

The filing fee is calculated as follows:

CLAIMS AS FILED, LESS ANY CLAIMS CANCELLED BY AMENDMENT

TOTAL CLAIMS = 28 - 20 = 8 x $18.00 =	$144.00
INDEPENDENT CLAIMS = 3 - 3 = 0 x $78.00 =	0
BASIC FEE =	$760.00
TOTAL OF ABOVE CALCULATIONS =	$904.00
REDUCTION BY 1/2 FOR SMALL ENTITY =	0
TOTAL FILING FEE =	$904.00

Respectfully submitted,

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PATENT

TO ALL WHOM IT MAY CONCERN:

Be it known we,

GREGG FREISHTAT of 5860 Winterthur Drive, Atlanta, Georgia 30326, U.S.A., a citizen of the United States of America, and
PALANISWAMY RAJAN of 6917D Roswell Road, Atlanta, Georgia 30328, U.S.A., a Permanent Resident of the United States of America and a citizen of India,

have invented new and useful improvements in an

APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

for which the following is a specification.

ATTORNEY CKET NO. 22022.0003
Utility Patent

APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

CROSS-REFERENCE TO RELATED PATENT APPLICATION

This application claims the benefit, pursuant to 35 U.S.C. § 119(e), of applicants' provisional U.S. Patent Application Serial No. 60/105,917, filed October 28, 1998, entitled "Apparatus and Method for Automated Aggregation and Delivery of and Transactions Involving Electronic Personal Information or Data" and of applicants' provisional U.S. Patent Application Serial No. 60/134,395, filed May 17, 1999, entitled "Apparatus and Method for Automated Aggregation and Delivery of and Transactions Involving Electronic Personal Information or Data".

BACKGROUND OF INVENTION

1. Field of Invention

The invention relates to an apparatus and process for automated aggregation and delivery of electronic personal information or data (PI). The invention further relates to the automation of transactions involving electronic PI.

2. Description of Related Art

Looking back over the last five years, it is apparent that as the Internet gained momentum, consumers demanded applications or services that make their online experience simpler, easier to use, and more satisfying. The development of successful Internet Sites has corresponded with a number of themes which have developed over the last few years. When carefully analyzed this evolution is a logical development of the emerging digital economy.

Prior to 1994, the Internet was not a mass media, in part, because the existing technologies (FTP, Archie, Usenet, and Gopher) were not user friendly and required the end user to do all of the work (e.g., the end user had to learn of an existing data source, find the address, navigate to the destination, and download the information). As more consumers began accessing the Internet, Search Engines were created to solve this

usability issue. With the advent of the commercial Search Engine, additional content could be easily added to the Internet and the end user had a means of finding and accessing this information. Consumers required better tools than Search Engines for organizing and accessing this wealth of generic content. Push technologies were explored, and eventually, the portal strategy was successfully adopted as an efficient way for consumers to easily access a variety of content sources in a single, easy to use format. As the volume of available online content continues to grow exponentially, portals are now confronted with the need to make different types of content available to different consumers based upon their particular preferences and tastes.

The phenomenal success of Internet portals and destination sites has demonstrated the importance of creatively and intelligently aggregating, organizing and presenting the mass of information available on the Web. Search engines, portals and destination sites have Internet strategies based on the frequency, duration and quality of end user visits to their sites. For this reason, destination sites and portals are constantly seeking content and/or technologies which drive quality traffic to their site and keep it there. Recent trends indicate that Internet users are up to 25 times more likely to come back to a site when this information is organized according to personal preferences.

FIG. 1 displays the current process of acquiring online PI 100. The end user first selects an information provider site in step 110. The end user proceeds to step 120 by locating and entering the Internet address of the selected information provider. This step may be accomplished in several manners with varying levels of complexity. A simple means for accomplishing this step is the utilization of a bookmark or favorite whereas locating an information provider for the first time might involve significant time and effort performing online searches. In step 130, the end users logs into the

selected information provider's Web site utilizing the site's specific logon protocol. This protocol usually involves verifying the identity of the end user using a user name and password or other means of verification, acquiring the verification data from cookies residing on the end user's system or a combination of requested data and cookie data. The end user continues in step 140 by navigating through Web pages on the information provider's Web site until the desired information is located. During this process, the end user is often required to visit Web pages of little or no use to the end user whose goals is to simply acquire the particular PI residing on the Web site. Ultimately in step 150, the end user is presented with the desired PI. The entire process 100 is repeated for each individual piece of PI desired by the end user. Under this PI access model, the end user must visit each separate information provider, track potentially different identity verification data for each, utilize a different user interface at each site and possibly wade through a significant number of filler Web pages.

FIG. 4 pictorial illustrates the architecture of this current access process. The end user 210 utilizes the client computer 220 to access each PI Web site 250 across the Internet 230. This current model suffers from several significant deficiencies. The end user must login to each site separately. Each separate site has its own graphical user interface. Each site wants the end user to stay and return; each visited site wants to retain end user focus for as long as possible. No true aggregation of PI exists; multiple accesses simply allow sequential access to particular pieces of PI.

One partial solution to these problems has recently evolved in the form of portal sites. Generic portal sites aggregate resources into categories and provide links to sites covering topics within those categories. Yahoo and Excite are examples of generic portal sites. These sites facilitate horizontal aggregation of generic content; horizontal

aggregation refers to aggregation of PI access within a particular information provider category such as banks or utility companies. Some portal site allows individual end users a limited capability to select and configure disparate generic PI. Generic PI refers to PI of interest to the particular end user that does not require specific identity verification to obtain. For example, an end user might be interested in the weather forecast for his local area. This information could be integrated into a portal page without requiring identity verification of the particular end user receiving this PI. The individualized portal page provides a significant benefit to users seeking to aggregate generic PI. However, current portal pages do not generally provide PI requiring identity verification such as an end user's stock portfolio or bank balance. Further, these pages do not facilitate transactions utilizing PI.

Under current technology, aggregating PI available over the Internet requires a significant burden in terms of time, effort and learning curve. An end user wishing to access his PI needs to individually visit a variety of information provider sites each with its own requirements, graphical user interface and login protocol.

SUMMARY OF THE INVENTION

In the present invention, a networked computer is used to facilitate end user access of, manipulation of and transactions involving electronic PI associated with the particular end user such as stock portfolio, local weather, sports scores, bank account balances or other pertinent information or data. According to the present invention, the PI relevant to the particular end user is aggregated on the networked computer. This information or data is delivered to the end user in a unified manner by a variety of selectable delivery platforms such as facsimile, client computer, telephone, conventional mail, electronic mail, pager, other wireless device, Web page or channel

or other delivery vehicle. The present invention further facilitates a variety of electronic transactions involving PI such as stock trading, retail purchases, bill payment, bank account fund transfers or other transactions.

A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor supports the aggregation of personal information. The processor selects an end user for personal information aggregation. Once the end user is selected, the processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

The above and other objects and advantages of the present invention will become more readily apparent when reference is made to the following description, taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a process diagram of the current process that end users perform to access Internet available PI.

FIG. 2 is a block diagram of the components that could be used to implement present invention.

FIG. 3 is a block diagram of the components of the PI engine.

FIG. 4 is a diagram of the current PI access architecture.

FIG. 5 is a diagram of an architecture supporting PI access utilizing an intermediary Web site.

FIG. 6 is a diagram of the cookie/client cache architecture.

FIG. 7 is a flowchart for accessing pages underlying particular PI via the traditional process of FIG. 1 and via springboard technology.

FIG. 8 depicts the integration model for the dynamic generation of HTML pages.

FIG. 9 displays the run-time process for dynamic generation of HTML page.

FIG. 10 illustrates a process for automated applet interaction utilizing a modified Java virtual machine.

FIG. 11 is a flowchart exemplifying an intermediary Web site transaction structure.

DETAILED DESCRIPTION OF THE INVENTION

A preferred embodiment of the invention is now described in detail. Referring to the drawings, like numbers indicate like parts throughout the views. As used in the description herein and throughout the claims that follow, the meaning of "a," "an," and "the" includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein and throughout the claims that follow, the meaning of "in" includes "in" and "on" unless the context clearly dictates otherwise.

In no time, end users will have to log into a large number of different Web Sites, each with separate passwords, security, rules, software and "look and feel" – just to get the information currently obtained by checking one place – the mailbox at the end of the driveway. The Internet will fundamentally change the way in which end users will access Personal Information (PI) and will make e-commerce as familiar as

using an ATM. "Personal Information" is all of the data that companies, information providers, have that is specific or unique to each person such as monthly bills, bank account balances, investments information, health care benefits, email, voice and fax messages, 401(k) holdings or potentially any other information pertinent to a particular end user.

The present invention alleviates several of the problems with the current PI acquisition methods by automatically aggregating PI, not only generic PI as aggregated by portals but also PI specific to the end user requiring identity verification for access. In one embodiment, the invention automates the PI acquisition and delivery process. FIG. 2 provides a block diagram of components that could be used to implement the present invention. The end user 210 accesses a client computer 220 running client software 270 which in a particular embodiment could be a general Web browser such as Navigator or Communicator (Netscape). The client computer 220 utilizes the Internet 230 to access a PI engine 240 running on a PI host 290. The PI engine 240 examines stored PI 280 for freshness. Any stale PI items are refreshed by directly reacquiring the PI from the particular information provider's Web site 250 running on the provider's computer system 260 accessed across the Internet 230. The PI engine 240 stores the fresh PI in its store 280 and delivers the PI to a selected destination, in this instance across the Internet 230 to the client computer 220 which displays the information to the end user 210 using the client software 270. The PI engine 240 refreshes all stale PI in a like manner prior to forwarding the aggregated PI to both the store 280 and the delivery destination, the client computer 220 in this instance. The PI engine 240 may refresh the PI sequentially or in parallel. For example, the end user's checking account balance would be updated through his bank's Web site, his email

from his particular email site, his portfolio information from his broker's site and his electricity bill from his electricity company's site.

FIG. 3 displays a block diagram of the components of the PI engine 240. The PI engine 240 is composed of both storage and processing components. The three primary storage components are the PI store 280, the PI Provider store 310 and the user store 360. The first storage component of the PI engine 240 is the PI store 280. The PI store 280 contains each individual's PI record 375; the PI associated with a particular end user is segregated from the PI of all other end users. The PI engine also utilizes a provider store 310 that maintains general parameters associated with particular PI providers. The general parameters of a PI provider define the types of verification data necessary and the procedures to be followed to gain access to the particular PI provider. Each PI provider record also contains the types of PI provided by the PI provider and the types of transactions supported by the provider. Along with the type of PI or transaction, the record also contains the additional types of data and procedures necessary to access the PI or execute the transaction. A user store 360 is also necessary to maintain configuration and verification information concerning particular end users. For each end user, the user selected PI providers, PI and transactions are registered along with the verification data necessary to acquire the PI or execute the transaction from the PI provider.

The PI store 280 may be implemented in a variety of ways. Referring to FIG. 2, the PI store 280 may comprise a database residing on the PI Host 290. Under this approach, the PI for each individual end user 210 is stored as a separate record or object 375 in the database. In yet another embodiment, the PI for each end user 210 could be

stored in a separate file 375, thus performing the task of segregating PI of different users at the file level.

In addition, or as an alternative, the PI associated with each end user 210 may reside on his/her client computer 220 using cookie technology as specified in D. Kristol and L. Montulli, "HTTP State Management Mechanism", Request For Comments (RFC) 2109, February, 1997 (available at http://www.ietf.org/rfc/rfc2109.txt), which is expressly incorporated herein in its entirety. The PI associate with the end user 210 would be stored as PI cookies 375. This implementation mechanism provides inherent support for segregating PI associated with one end user 375 from PI associated with all other end users. Utilizing this method as a substitute for a centralized store provides a layer of security against unauthorized access. As a further measure, PI data stored in cookies could be stored in an encrypted format.

FIG. 6 provides a diagram of a typical implementation of the PI store 280 using cookie technology; references in the foregoing description are also made to FIG. 3 with respect to the internal workings of the PI engine 240. When an attempt is made to access PI by an end user 210 directly, or through an intermediary Web server, the PI access/transact component 340 of the PI engine 240 would retrieve stored PI 375 from the PI store 280. Under this approach, this stored PI 375 would be received directly from cookies sent by the client computer 220 of the end user 210. The PI access/transact component 340 would perform any decryption if necessary. Any updates required would be obtained by direct access of PI providers 250. The PI deliver component 350 would provide the mechanism for both updating the PI store 280 as well as transmitting the requested PI to the end user 210, directly or through an intermediary Web site. The PI deliver component 350 would place the updated PI in

the PI store 280 by replacing the outdated PI cookies 375 stored on the client computer 220. The PI deliver component 350 would also handle any encryption if necessary. The PI deliver component 350 would also be responsible for transmitting requested PI. In a preferred embodiment, the PI store 280 would be implemented using this cookie-based architecture.

The user store 360 may be implemented in a variety of ways. Referring to FIG. 2, the user store 360 may comprise a database residing on the PI Host 290. Under this approach, the personal configuration data for each individual end user 210 is stored as a separate record or object in the database. In addition, or as an alternative, the end user data could be distributed in a manner similar to the cookie/cache architecture describe above with respect to the PI store 280.

In a preferred embodiment, the user store 360 could be implemented through personal information configuration (PIC) files. PIC files store a personal profile such as name, address, and social security number in secure, encrypted fashion for each end user. PIC files facilitate automatic registration of end users with information Providers via the end user configuration component 330. This component will read the PIC file and, using retrieved personal information, pre-populate registration templates for selected Providers. Then, it will prompt the user to enter required information that is missing from profile, if necessary. If the information is complete, the registration is automatically completed. Next, the end user configure component 330 completes any Provider registration forms, gets responses and updates the end user's PIC.

The four primary processing components access and manipulate the data in the three stores. The processing components may execute on a single processor, such as a file server computer system based on a Pentium class (MMX, PRO, II, III, etc.) central

processing unit or an equivalent, or multiple processors. These four processing components are the Baseline configure component 320, the end user configure component 330, the PI access/transact component 340 and the PI delivery component 350 as seen in FIG. 3. The Baseline configure component 320 provides the interface by which new user selectable PI providers are added to the system. This component 320 might be implemented in a variety of ways including trial and error followed by manual entry of configuration information, semi-automated trial and error (automated location of Hypertext Markup Language (HTML) <FORM> elements, Javascript functions and Java applets) followed by manual entry of configuration information or, preferably, configuration by example (executing the protocol in a simulated Web client where the simulated Web client automatically generates a list of required data and a list of steps in the access process). These processes would be utilized at two levels: the first level being the set of data and steps required for general access to the particular PI provider and the second level being the set of additional data and steps required for accessing each particular piece of PI on the PI provider's site. The baseline configuration component 320 may be triggered independently when a new PI provider is added to the system, or it might be triggered as a result of a failure of the PI access/transact component 340 potentially indicating a change in access requirements for the failed access. This latter warning would more likely result where the PI access/transact component 340 has made a comparison between requirements supplied by the Provider store 310, both general to the PI provider and specific to the PI or transaction, and the end user data supplied by the user store 360 after seeking end user verification via a request of the end user to confirm the previously entered required access data via the end user configure component 330 and found an inconsistency. When an inconsistency

is determined, updates to the Provider store 320 are made to bring the Provider data into conformance with current access/transaction requirements.

The end user configure component 330 allows an end user to select and configure PI and transactions of interest to the specific user. This configuration information is maintained in the user store 360. When an end user initially subscribes to the system according to the present invention, the system allows the user to select the types and sources of PI and/or transactions desired. First, the system requests permission from the end user to act on his behalf to obtain any selected PI and to execute any authorized transactions. Next, the system provides the user with a list of known information suppliers and the types of PI supplied from and transactions supported by the particular PI provider from the Provider store 320. The system requests the verification data necessary for accessing each selected PI provider and the additional data required by the particular PIs and/or transactions desired from that PI provider. Assuming the end user is already a registered user with the selected PI provider or the particular PI provider does not require prior registration, the data supplied by the end user is placed in the user store 360.

One method of obtaining any cookie data would be for the end user to access each previously accessed PI utilizing the PI engine 240 as a proxy server. The PI engine 240 would pass the cookie data to the PI provider site with the appropriate Web page requests to obtain the PI or execute the transaction and with the end user's permission retain a copy of the cookie data in the his record in the user store 360. An alternate means of obtaining the cookie data would be a direct upload of the cookie information from the end user's computer. In a preferred embodiment, no cookie data

is necessary where a user is already registered with a provider. All that is necessary is the verification data for login.

If the end user does not have the requisite information because he is not a registered user of a selected PI provider, the user configure component 330 prompts the user for the information necessary to register the end user with the PI provider and performs the registration procedure required by the PI provider. A simulated Web client could perform this process automatically supplying the access data as required and sending any necessary cookie data. The manner in which such a simulated client registers the end user depends significantly upon the interaction method used on the PI provider Web site. If the Web site uses HTML forms and common gateway interface (CGI) applications, the end user configure component 330 can formulate a uniform resource locator (URL) to replicate the effect of actual form usage and submit this URL to the simulated Web client. The use of a URL to mimic an HTML form is equivalent to manually entering the data into the Web <FORM> element. See Kerven, Foust, Zakour, HTML 3.2 Plus How-To, Waite Group Press, 1997, pp. 559-569. If the Web site uses a mixture of HTML forms and Javascript functions, a simulated Web client with a modified Javascript interpreter could effectively register the user by following the end user registration process for the particular PI provider. The registration process to follow would be obtained from the record of the particular PI provider in the Provider store 320. The Javascript interpreter in the simulated Web client would follow this procedure and supply the data supplied by the end user. A similar process could be used if the registration process on the PI provider Web site utilizes a Java applet. A Web client with a modified Java bytecode interpreter could effectively register the user by following the end user registration process stored for the particular PI provider in the

Provider store 320. The bytecode interpreter would supply the data previously entered by the end user rather than requiring interactive input from the end user. If the PI provider Web site utilizes a combination of forms, scripts and applets, the individual procedures above could be used in combination to accomplish the desired registration.

With reference to FIG. 2 and FIG. 3, a modification of the Java virtual machine (VM) could allow for automated interaction between the various functional components of the PI Engine 240 and Java applet available through provider Web servers 250. Templates for interacting with particular applets could reside in the Provider store 310. The specific input data utilized by such templates could be stored in the User store 360. When a functional component such as the end user configure 330 or the access/transact 340 components requires automated communication with a Java applet on a provider Web server 250, the modified Java VM would facilitate this interaction.

FIG. 10 illustrates one process utilizing such a modified Java VM to achieve such automated interaction. The functional component requiring interaction identifies the provider and the particular applet on that provider with which the component needs to interact in step 1010. In step 1020, the component accesses the necessary template for interacting with the applet from the Provider store 310. Proceeding to step 1030, the component accesses the User store 360 to obtain the data required by the template. The modified Java VM interprets the applet in step 1040 and, rather than requiring interactive input from a user as in a normal Java applet execution, awaits input from or output to the interacting functional component of the PI engine. In step 1050, the functional component supplies input data to the modified Java VM according to the accessed template and retrieved data and receives output data according to the accessed template. Steps 1040 and 1050 repeat so long as additional input to or output from the

applet continues. Upon termination of the applet, the functional component continues with its own processing in step 1060.

A successful registration could result in displaying the registration information to the end user for future reference. Further, the end user configure component 330 stores the requisite access verification data for the PI provider and the additional data required to access the selected PI or transaction in the user store 360.

In a preferred embodiment of such automated registration, any necessary cookie data would be accepted and stored as needed by the end user configure component 330. In many cases, cookie data is session specific and, therefore, of little long term utility. Cookies generated during the registration process are used solely during the registration process then discarded once registration is complete.

A failed registration could result from several situations. First, the end user attempting to register with the PI provider does not qualify for registration; for example, an end user attempting to register with a bank with whom the end user does not maintain an account and where the bank only allows access to account holders. Next, the end user may have supplied improper or incorrect information. For example, a bank registration process might require a social security number, a password, a bank account number and the maiden name of the end user's mother; if the user entered an incorrect social security number, the registration process would fail. Finally, the PI provider may have altered the registration procedure for its Web site. In this situation, following the process supplied from the Provider store 320 would yield a failed registration. In the instance of any registration failure, the end user could be presented with the data initially supplied to the system for registration. The system could then ask the end user to double check the correctness of the information provided and to

correct and resubmit the data if an error is found. A second failure resulting from the submission of identical requisite data might generate an error message presented to the end user stating that either the end user is ineligible to access the selected PI from the selected PI provider or that alteration by the PI provider may have caused an error in registration. This second failure could also trigger a warning suggesting the need to potentially reconfigure the record for the PI provider in the Provider store 320.

Ultimately, the user store 360 would contain a record for each end user. This record as previous described could be a database entry, one or more cookies or a file such as a PIC file. Each record would identify the selected PI providers along with the general access verification data needed and also under each PI provider would be a list of PI supplied and transactions supported by the particular PI provider of interest to the end user along with the additional data, if any, necessary to access that PI or execute that transaction. Specifically, duplicative information such as an end user's name would be centrally stored in the record once.

The end user configure component 330 also allows the end user to select one or more delivery destinations. One destination might be the end user's computer as exemplified by the client computer 220 running client software 270 in FIG. 2; however, a computer is not the only destination contemplated by the present invention. The destination for PI delivery could include facsimile, electronic mail, telephone, conventional mail, pager, other wireless device such as a Palm Pilot (3 Com), Web page or channel, Web browser or other delivery mechanism. The present invention also contemplates indirect access of PI by the end user utilizing a Web site as an intermediary; however, such indirect access would not require the end user to specify a delivery destination unless additional delivery options were desired.

Further, access to the end user configure component 330 may occur through direct access to the PI engine via the Internet as contemplated by the client computer 220 running client software 270 in FIG. 2; however, alternative methods of access are equally feasible. For example, the user might indirectly access the PI engine through the use of an intermediary Web site. A telephone interface to allow access to the end user configure component is another alternative.

With reference to FIG. 3, the PI access/transact component 340 supports the update, acquisition and transaction functionality of the PI engine 240. The PI access/transact component 340 is responsible for accessing and storing user PI and executing transactions authorized by the end user. When access or update is needed for a selected end user, the PI access/transact component 340 combines information from the Provider store 320 and the user store 360 to update end user PI in the PI store 280. For each piece of PI requiring access or update, the PI access/transact component 340 looks up the access procedure and information needed for the particular PI in the Provider store 320. The verification and access data is found in the user store 360. The PI access/transact component 340 utilizes this information to connect to the PI provider's Web site across the Internet and to access the PI. Where multiple pieces of PI require updating or access, the accesses may occur in series or parallel.

Requested transactions would be similarly supported. For each transaction, the PI access/transact component 340 combines information from the Provider store 320 and the user store 360 to perform the requested transaction. The PI access/transact component 340 looks up the transaction procedure and information needed for the particular transaction in the Provider store 320. The verification and access data is found in the user store 360. The PI access/transact component 340 utilizes this

information to perform the transaction across the Internet from the PI provider's Web site

A simulated Web client could perform access or transaction processes automatically supplying access and verification data as necessary. The manner in which such a simulated client access PI or execute transactions depends significantly upon the interaction method used on the PI provider Web site. If the Web site uses HTML forms and common gateway interface (CGI) applications, the PI access/transact component 340 can formulate a uniform resource locator (URL) to replicate the effect of actual form usage and submit this URL to the simulated Web client. The use of a URL to mimic an HTML form is equivalent to manually entering the data into the Web <FORM> element. See Kerven, Foust, Zakour, HTML 3.2 Plus How-To, Waite Group Press, 1997, pp. 559-569. If the Web site uses a mixture of HTML forms and Javascript functions, a simulated Web client with a modified Javascript interpreter could effectively access the PI or perform the transaction by following the PI access/transact process for the particular PI or transaction respectively. The access or transaction process to follow would be obtained from the record of the particular PI or transaction in the Provider store 320. The Javascript interpreter in the simulated Web client would follow this procedure and supply the data found in the user store 360. A similar process could be used if the PI provider Web site utilizes a Java applet. A Web client with a modified Java bytecode interpreter could effectively access PI or perform transactions by following process stored for the particular PI or transaction in the Provider store 320. The bytecode interpreter would supply the data from the user store 360 rather than requiring interactive input from the end user. If the PI provider Web

site utilizes a combination of forms, scripts and applets, the individual procedures above could be used in combination to accomplish the desired access.

In a preferred embodiment of such automated accesses or transactions, any necessary cookie data would be accepted and stored as needed by the PI access/transact component 340. In many cases, cookie data is session specific and, therefore, of little long term utility. Cookies generated are used solely during these functions then discarded once the mining or transaction operation is complete.

In order to provide personal information to an end-user quickly after login, it is necessary for the PI access/transact component 340 to select an end user for data harvesting prior to the login of the end user. One approach to this solution is to update all of an end user's PI whenever the end user, directly or through an intermediary Web site, requests access to his/her PI. Another approach would be to update all of an end user's PI supplied by a particular provider whenever PI from that supplier is requested. Thus, the act of logging into the system by an end user effectively selects that end user for immediate PI update. However, this approach may result in the inefficient use of the PI Engine 240 resources.

Given the large number of potential users and providers, and the goal of providing the freshest data possible, another embodiment includes an algorithm developed to optimize the schedule in which end users are selected for data harvesting from a provider. This algorithm factors in the provider's update policy, the user's login habits, and the user-provider account characteristics. The proper application of the algorithm should ensure that PI is harvested as infrequently as possible for a given user, thus minimizing system resource consumption.

If the next provider update time and the next expected user login can be accurately predicted, a model can be created that will allow for smarter harvesting. Rather than harvesting data for all users of a provider at once when the provider updates its site, the harvesting can be spread out over time based on expected login times of users and network activity profiles. For example, if Provider A updates its site on Friday night and a large number of users of that provider are not expected to login again until Monday morning, the harvesting load can be distributed across multiple days. This has the advantage of minimizing both the peak loading of the PI Engine 240 as well as consumption of the provider's bandwidth by the PI Engine 240. To gain this optimization, the PI Engine 240 must maintain and refine models of each provider and user. Such data can be maintained in the provider store 310 and the user store 360 respectively.

Each time a user utilizes the PI Engine 240, the time and date may be captured. Once a sufficient number of login times are accumulated, they may be analyzed with respect to day of month, day of week, and time of day. These are used in a model to predict the next expected user login. The model is then tested and refined with subsequent logins until a measurable degree of confidence is established. Once high confidence is determined, the user model is incorporated into the adaptive harvesting scheduler. Until a high confidence level is reached for a particular end user one of the aforementioned harvesting approaches may be used.

Each provider updates its site based on policy driven by their unique resources and business model. For any adaptive scheduler to work, the policy for each provider must be modeled. In some cases, the policy is self-evident. In others, it must be

determined empirically. A provider's policy will most likely fall into one of the following categories:

- Type I. Updated periodically for all users
- Type II. Updated periodically relative to each user
- Type III. Updated in a pseudo-random manner

The following three approaches may be used based upon provider type.

Type I Provider Policy Scheduling Algorithm

1. Assume users with a "no confidence" model have an immediate login time.

2. Order the users chronologically based on their predicted login time.

3. Shift the expected login time for all users back one hour.

4. Perform a density curve fit along temporal boundaries to get a polynomial function that can be used to determine the number of user accounts to harvest for a given epoch.

5. Perform an integral matching algorithm with the inverse of the network activity curve for the time period in question to adjust the distribution curve.

6. If possible, re-distribute peak harvesting time toward time zero to flatten the distribution curve.

7. Assign harvesting times to the sorted users according to the distribution curve.

8. Monitor time and harvest the user account when appropriate.

Type II Provider Policy Scheduling Algorithm

For each provider that falls into this category, an attribute of the user must be identified that determines when the personal information is updated. In some cases, the user may need to be queried for the information. In others, it can be determined from the harvested information. If the attribute cannot be established for a user via either of

these means, the provider site may be monitored daily for changes in personal information until a pattern is established.

Since there is a natural, even distribution of accounts updated by a provider for a given day, a user's account can be harvested an hour before his expected login time. As in the Type I algorithm, users with a "no confidence" model should be immediately harvested.

Type III Provider Policy Scheduling Algorithm

This type of policy is the most difficult of all. Since the provider updates a user's account in a non-deterministic manner, a decision must be made for each provider as to the criticality of the information relative to the user. For those highly critical providers, each user account should be harvested daily, perhaps even more frequently. For those less critical providers, user accounts should be harvested less frequently and possible when overall system activity is low.

The PI deliver component 350 is responsible for formatting and delivering the PI to the end user. Usually delivery will only occur subsequent to updating all stale PI. The PI will be delivered to one or more destinations (e.g. facsimile, telephone, pager, Web browser, e-mail, etc.) as specified in the user store 360 except where the PI is accessed via an intermediary Web site. Where the destination is not an intermediary Web site, the PI deliver component 350 performs all formatting necessary to deliver the PI to the appropriate destinations. For example, where the destination is a Web browser, the PI would be formatted as an HTML document, or where the destination is a telephone, the PI would be submitted for voice synthesis and transmission.

In the case of an intermediary Web site, the PI is delivered in a format configurable by the intermediary Web site. FIG. 5 pictorial illustrates a possible

embodiment of the current invention utilizing an intermediary Web site. An end user 210 utilizes a client computer 220 to access an intermediary Web site 510 across the Internet 230. The end user 210 logs into the intermediary Web site 510. The intermediary Web site 510 contacts the PI engine 240 across the Internet 230 and directly receives the end user's PI updated as required from the PI provider Web sites 250. The intermediary Web site 510 receives the PI, incorporates it into pages according to its particular formatting style and graphical user interface and delivers these pages to the end user 210. The use of the PI engine 240 is transparent to the end user 210. Further, an intermediary Web site 510 serving aggregate PI to an end user 210 may, and most likely will, simultaneously serve as a PI provider.

In another embodiment, this formatting occurs via a dynamic HTML generation system combining stylistic and layout information from a variety of sources. The PI deliver component 350 generates custom HTML pages dynamically. These pages are customized based on a number of stylistic factors (such as background color, foreground color, font size, color and style, page layout, etc) from a variety of sources and content from a variety of sources. Information providers, distributors, the end user, the PI deliver component 350 or any combination of these sources, or other relevant sources, may provide customization factors used in the page generation. Finally, each HTML page must be filled in with data. The data used in such pages may originate from such sources as information providers, distributors, the end user, the PI deliver component 350 or any combination of these sources, or other relevant sources. The required solution is a system representing a generic algorithm for performing such HTML generation at run-time. The style and content may be provided in any suitable format such as the Extensible Stylesheet Language (XSL), as specified by W3C in

http://www.w3.org/TR/WD-xsl/, which is expressly incorporated herein by reference in its entirety, and/or the Extensible Markup Language (XML) as specified by W3C in http://www.w3.org/TR/REC-xml, which is expressly incorporated herein by reference in its entirety, or other suitable formatting standard. The key requirements for such a system are complete encapsulation of the problem domain and run-time efficiency.

In preferred embodiments, the solution is based on the following basic model as depicted in FIG. 8:

1. Six sets of customization factors are identified: distributor content 810, provider content 820, distributor style specification 830, provider style specification 840, user-specific content 850 and user-specific style 860.
2. Each set of customization factors 810-860 is considered a separate, independent and required input to the run-time system 870 that performs dynamic page generation.
3. Each input 810-860 will be in form of an XML stream.
4. Output 880 will be in form of an HTML stream.
5. The dynamic page generation system 870 will produce valid output 880 for each set of six valid inputs 810-860.

FIG. 9 illustrates an actual run-time sequence of input processing by such a system 870:

1. Distributor content 810 is combined with provider content 820 and with user-specific content 850 to produce a complete content specification 930 by the content merger unit 910.

2. Distributor style 830 is combined with provider style 840 and with user-specific style 860 to produce a complete style specification 940 by the style merger unit 920.

3. The style specification 940 is applied by the style applicator 950 to content specification 930 in order to produce the resulting page 880.

In order to completely encapsulate the problem domain, the following requirements must be placed on the system 870:

1. Each XML input 810-860 is a valid XML stream.

2. All content specifications 810, 820 and 850 are valid with respect to the same Document Type Definition.

3. All style specifications 830, 840 and 860 are valid with respect to the same Document Type Definition (such as the XSL DTD standard).

4. The merging units 910 and 920 whose task is to take two or more XML streams and produce a combined XML output must be able to produce such output for any set of valid XML inputs.

Another method of performing this task would be to format PI as HTML elements with predefined CLASS attributes. The intermediary Web site receiving these elements could dynamically include them in page forwarded to the end user of the PI. The pages incorporating such elements could include different style information associated with the predefined CLASS set. Level 1 cascading style sheet convention could be used to implement such configurability. See Kerven, Foust, Zakour, HTML 3.2 Plus How-To, Waite Group Press, 1997, pp. 651-693; Walsh, "An Introduction to Cascading Style Sheets," World Wide Web Journal, Winter 1997, pp. 147-156. This option requires minimal programmatic support by the intermediary Web site but

restricts to some degree the intermediary Web sites flexibility in presenting the PI to the end user.

Alternatively, an intermediary Web site could develop an application utilizing a standardized application programming interface (API) to directly access the PI data. In this instance, the PI deliver component 350 could either be bypassed or potentially used as the component responsible for servicing API requests for data. Under this model, the intermediary Web site would be responsible for all formatting decisions with respect to the raw PI data. This implementation option requires additional programmatic support by the intermediary Web site but allows for greater flexibility in the use of the raw PI.

The ability to utilize an intermediate Web site to deliver PI is of significant utility. This capability allows an end user already familiar with an existing PI provider to access not only the PI associated with the particular PI provider but also all PI from other PI providers in the comfort of a familiar user interface, namely the existing PI provider Web site. In this situation, the request for PI would directly originate with the intermediary PI provider Web site and indirectly from the end user. Security measures would restrict access to authorized intermediate Web site access. These measure might include verification of the end user and the intermediate Web site. Further, verification of the association between the end user and the particular intermediate Web site might also be required for additional security.

In addition, the use of an intermediary Web site also supports a novel transaction model. In this transaction model, the intermediary site subsidizes, or fully compensates, the PI engine administrator for services provided to the end user. These transactions are facilitated via the auditing and tracking capabilities of the PI engine.

These capabilities allow the calculation of per user fees, per transaction fees, per access fees or some combination thereof to be assessed. The assessed values could be directly charged to the intermediary Web site. Alternatively, such values could be debited from a minimum monthly fee charged to the intermediary Web site with any fees beyond the minimum charged directly to the intermediary Web site.

FIG. 11 depicts a flowchart of a typical process according to the described model. The intermediary Web site pays a minimum monthly fee in step 1110. In step 1120, the PI engine audits and tracks end user usage via the intermediary Web site. The audited usage is used to assess a fee on a per user, per access, per transaction or combination basis. In step 1130, this audited amount is debited from the fee paid in step 1110. In step 1140, the intermediary Web site is charged for any fees in excess of the minimum fee paid.

Often an end user may require access to the underlying Web page generated by the provider of a particular piece of PI. The delivery component may deliver not only the PI but also an access point directly to the provider's page supplying that PI. The access point may take the form of a link, a form button or some other interactive access mechanism.

Such an access point significantly improves the efficiency of accessing the underlying page by the end user as exhibited by FIG. 7. In the traditional process 100 for accessing PI, the end user must proceed through numerous intermediary pages requiring a variety of often tedious interactions before reaching the desired page.

The end user must first identify the Provider 110. Next, the end user must locate the Provider's Web address 120. Then, the user the requests the Provider's login page 130. If the end user does not remember the requisite information, this information

must be found, or the desired information will remain inaccessible via the Web. The end user then navigates the Provider's Web site 140. This often entails visiting the Provider's main page 710 followed by viewing a variety of intermediate pages on the Provider's site 720. The end user may have to backtrack several times to the main page 710 or accidentally leave the system entirely forcing a second login 140 before finally locating the desired information 150.

Utilizing springboard technology, the entire process 750 is streamlined into the single click of an access point. The delivery component of the PI Engine delivers an access point to the Provider's underlying page along with the PI. As a consequence, the end user need only perform a single interaction with the PI presentation page 760. This interaction immediately performs the requisite interactions with the Provider's Web site to bring the user to the desired underlying Web page 150.

In one embodiment, this springboard technology could be implemented utilizing a Java applet. With respect to FIG. 2, the applet would be downloaded from the PI Host 290 by the end user's client software 270, usually a Web browser, and executed locally by the end user's computer 220. The applet would drive the client software 270 to the desired page. Such an applet could retrieve procedures and data for driving the client software from the Provider store 310 and the User store360.

In a further embodiment, the PI engine 240 could act as a proxy server directly accessing the Provider store 310 and the User store 360 as required. When the PI engine 240 receives the request to jump to the source of a particular piece of PI, the engine performs the necessary actions to navigate to the desire page and forwards the desired page to the end user's computer 220. Further interactions with the page might require additional proxying by the PI engine 240 as accumulated cookie data may

reside on the PI Host 290. This embodiment is limited to use in handling standard HTTP traffic rather than secure HTTP traffic.

In a preferred embodiment, the springboard provides the end user with automated login into the PI Provider site 250 and allows the end user 210 to navigate via the client software 270. This automated login could be accomplished through the utilization of a hypertext transfer protocol (HTTP) redirect. Upon receiving the a springboard access request from the end user 210 via the client software 270, the PI Host 290 requests the login page from the PI Provider site 250 targeted by the springboard access. The PI engine 240 running on the PI Host 290 receives this login page and constructs a login request by accessing the proper data in the Provider store 310 and the User store 360. The login request is embedded in the HTTP redirect which is forward to the client software 270. The client software 270 is redirected to the targeted PI Provider site 250, and the end user 210 is automatically logged into this site.

Alternatively, this functionality could be implemented via a Java applet as described above. In addition, the PI engine 240 could generate a Javascript page containing the pertinent login request rather than an HTTP redirect. The Javascript page could be returned to the client software 270. This page would then be executed by the client software 270 to accomplish the automated login.

The PI engine 240 of FIG. 3 may also include a site monitor 370 processing component. This component would systematically monitor supported PI provider Web sites for changes. This component enhances the ability of the system to identify alterations in PI provider Web site procedures, data requirements and cookies requirements. This component increases system efficiency by supplementing or

supplanting alteration identification via feedback from the PI access/transact component 340.

A further embodiment of the present invention might support the localize manipulation of PI. This could be accomplished where the client software 270 running on the client computer 220 in FIG. 2 is a specialized Web client rather than a general Web client such as Netscape. This specialized client might utilize Web channel technology to automate the local PI download and update processes. Where the PI store is implemented via the aforementioned cookie architecture, this specialized client may provide direct local access to stored PI.

In another embodiment, the PI engine 240 of FIG. 3 might support both system supported PI providers as well as PI providers specific to particular end users. In this embodiment, an end user is not limited to PI available from PI providers present in the Provider store 310. For an end user to add PI provided by a non-supported PI provider, the end user would access the Baseline configure component 320 and create a configuration for the non-supported PI provider. The PI provider and PI configuration along with the verification and access data would be stored along with the user's record in the user store 360.

A further embodiment of the present invention supports the inclusion of PI transaction procedures and access requirements in the Provider store 310 of FIG. 3. The end user specific information necessary to realize such a transaction would reside with the user record in the user store 360. The functionality of the PI access/transact component 340 would expand to support the performance of transactions. This additional functionality could be supported in a manner similar to the procedure described above with respect to performance of access utilizing a simulated Web client.

A further feature of this embodiment would include automated or semi-automated account management by providing trigger events to automatically initiate a transaction.

For instance, with reference to FIG. 2 an end user 210 would be able to maintain his/her accounts online through the PI Engine 240. If an information provider has the capability of receiving payments online, the PI Engine 240 could support complete or partial automation of such transactions. If there is a billing due date for a certain information provider, PI Engine 240 could flag that information and send email to the end user 210 notifying him/her of the bill due. Thus, the user will not have to check each of his/her providers individually for due date information. The PI Engine 240 could also automated payments on a limited range of billing amount for providers who allow payments over their Web servers 260, then send an email to the user with the notification of payment.

Due date acquisition could be accomplished utilizing the PI access/transact component 340 seen in FIG. 3. The due date information would be available to the end user via any delivery means supported by the PI deliver component 350. The PI access/transact component 340 would use standard e-commerce bill-paying methods to pay the user's bill/s to the provider if he/she chooses. Once the bill is paid, then an email notification will be sent to the user with the provider information and payment information. The user can specify the range of amount stored in the user store 360 that will be paid automatically. If the bill exceeds the amount specified by the user, then PI engine will simply send out an email notification to the user instead of paying the bill automatically.

The embodiments described above are given as illustrative examples only. It will be readily appreciated that many deviations may be made from the specific

embodiment disclosed in this specification without departing from the invention. Accordingly, the scope of the invention is to be determined by the claims below rather than being limited to the specifically described embodiments above.

What is claimed is:

1. A system for delivering personal information from at least one information provider to at least one end user comprising:

(a) a user store for storing end user data associated with each end user;

(b) a provider store for storing information provider data associated with each information provider;

(c) a personal information store for storing personal information associated with each end user;

(d) a processor in communication with the user store, the provider store and the personal information store, for performing the steps of:

(i) connecting with at least one information provider;

(ii) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers; and

(iii) storing the retrieved personal information in the personal information store.

2. The system of claim 1, wherein the processor performs the additional step of monitoring information providers for changes.

3. The system of claim 1, wherein the processor performs the additional step of updating the provider store to conform with requirements of the information provider.

23 20
~~4.~~ The system of claim ~~1~~, wherein the processor performs the additional step of executing a transaction for the selected end user with a selected information provider based on the end user data associated with the selected end user and the information provider data associated with the selected information provider.

24 23
~~5.~~ The system of claim ~~4~~, wherein the processor automatically performs the transaction execution step according to end user data in the user store.

25 20
~~6.~~ The system of claim ~~1~~, wherein the processor performs the additional step of outputting the personal information associated with the selected end user from the personal information store.

26 25
~~7.~~ The system of claim ~~6~~, wherein the outputting step performed by the processor outputs the personal information to a delivery platform specified in the end user data associated with the selected end user.

27 26
~~8.~~ The system of claim ~~7~~, wherein the specified delivery platform is selected from the group consisting of electronic mail, facsimile, pager, telephone, wireless device, ftp server, Web server, gopher server and Web client.

28 25
~~9.~~ The system of claim ~~6~~, wherein the outputting step of the processor outputs the personal information via a world wide web site.

29 28
~~10.~~ The system of claim ~~9~~, wherein the outputting step of the processor outputs personal information as a formatted Web page to the world wide web site.

30 28
~~11.~~ The system of claim ~~9~~, wherein the outputting step of the processor outputs personal information as formatted Web elements to the world wide web site.

31 28
~~12.~~ The system of claim ~~9~~, wherein the outputting step outputs personal information data to the world wide web site.

32 20
~~13.~~ The system of claim ~~1~~, wherein the connecting step of the processor performs the following substeps:

(A) accessing the end user data associated with the selected end user;

(B) identifying information providers specified in the accessed end user data; and

(C) establishing a communication link with each of the identified information providers.

Sub A2

14. A method for delivering personal information to at least one end user from at least one information provider comprising the steps of:

(a) connecting with at least one information provider;

(b) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers; and

(c) storing the retrieved personal information in a personal information store.

2
~~15.~~ The method of claim ~~14~~, further comprising the step of monitoring information providers for changes.

3
~~16.~~ The method of claim ~~14~~, further comprising the step of updating the provider store to conform with requirements of the information provider.

4
~~17.~~ The method of claim ~~14~~, further comprising the step of executing a transaction for the selected end user with a selected information provider based on the

accessed end user and the accessed information provider data associated with the selected information provider.

5 4
~~18.~~ The method of claim ~~17~~, wherein the execution step is triggered according to the accessed end user data.

6 1
~~19.~~ The method of claim ~~14~~, further comprising the step of outputting the personal information associated with the selected end user from the personal information store.

7 6
~~20.~~ The method of claim ~~19~~, wherein the outputting step outputs the personal information to a delivery platform specified in the accessed end user data.

8 7
~~21.~~ The method of claim ~~20~~, wherein the specified delivery platform is selected from the group consisting of electronic mail, facsimile, pager, telephone, wireless device, ftp server, Web server, gopher server and Web client.

9 6
~~22.~~ The method of claim ~~19~~, wherein the outputting step outputs the personal information via a world wide web site.

10 9
~~23.~~ The method of claim ~~22~~, wherein the outputting step outputs personal information as a formatted Web page to the world wide web site.

11 9
~~24.~~ The method of claim ~~22~~, wherein the outputting step outputs personal information as formatted Web elements to the world wide web site.

12 9
~~25.~~ The method of claim ~~22~~, wherein the outputting step outputs personal information data to the world wide web site.

13 1
~~26.~~ The method of claim ~~14~~, wherein the connecting step comprises the substeps of:

(i) accessing the end user data associated with the selected end user;

(ii) identifying information providers specified in the accessed end user data; and

(iii) establishing a communication link with each of the identified information providers.

27. A computer-readable, digital storage device storing executable instructions which cause a processor to deliver personal information by performing the steps comprising of:

(a) connecting with at least one information provider;

(b) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers; and

(c) storing the retrieved personal information in a personal information store.

28. The storage device of claim 27, further storing executable instructions to perform the connecting step by performing substeps comprising of:

(i) accessing the end user data associated with the selected end user;

(ii) identifying information providers specified in the accessed end user data; and

(iii) establishing a communication link with each of the identified information providers.

ABSTRACT

A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor selects an end user for personal information aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

PRINT OF DRAWINGS
AS ORIGINALLY FILED

1

Figure 1
(Prior Art)

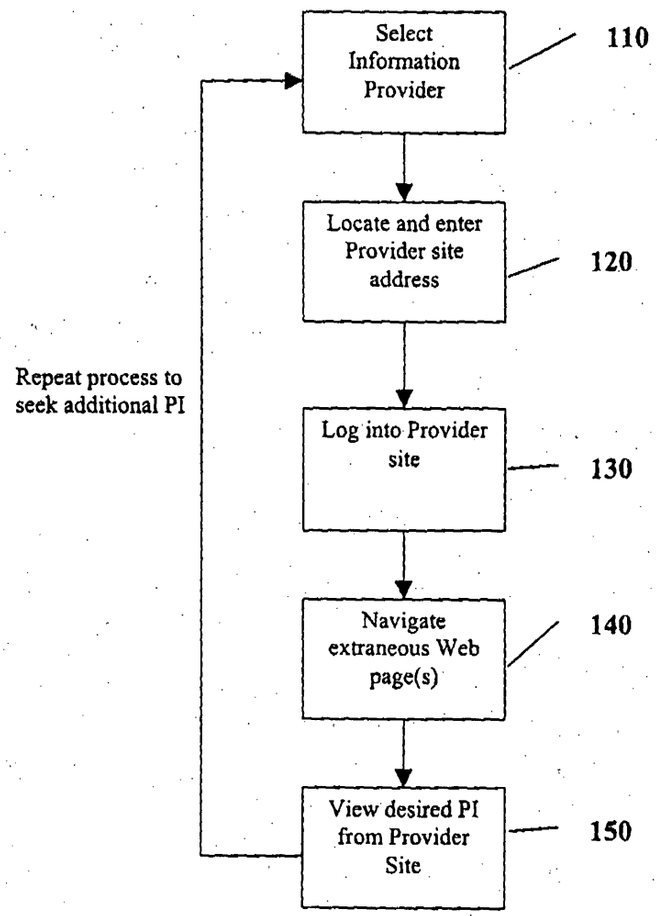
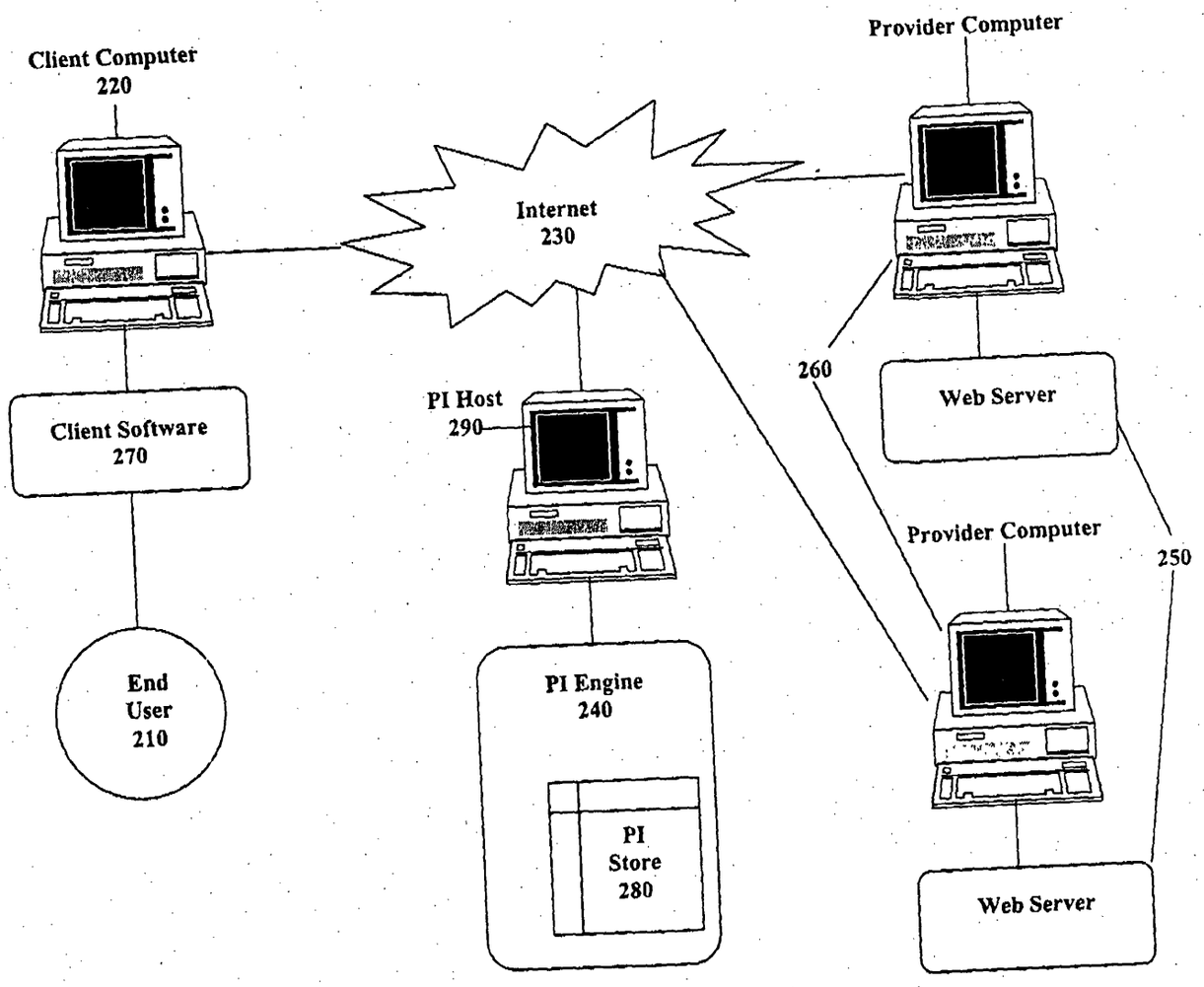


Figure 2


Client Computer
220
Internet
230
Provider Computer
260
Web Server
Client Software
270
PI Host
290
Provider Computer
250
End
User
210
PI Engine
240
PI
Store
280
Web Server

PRINT OF DRAWINGS
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Figure 3
240

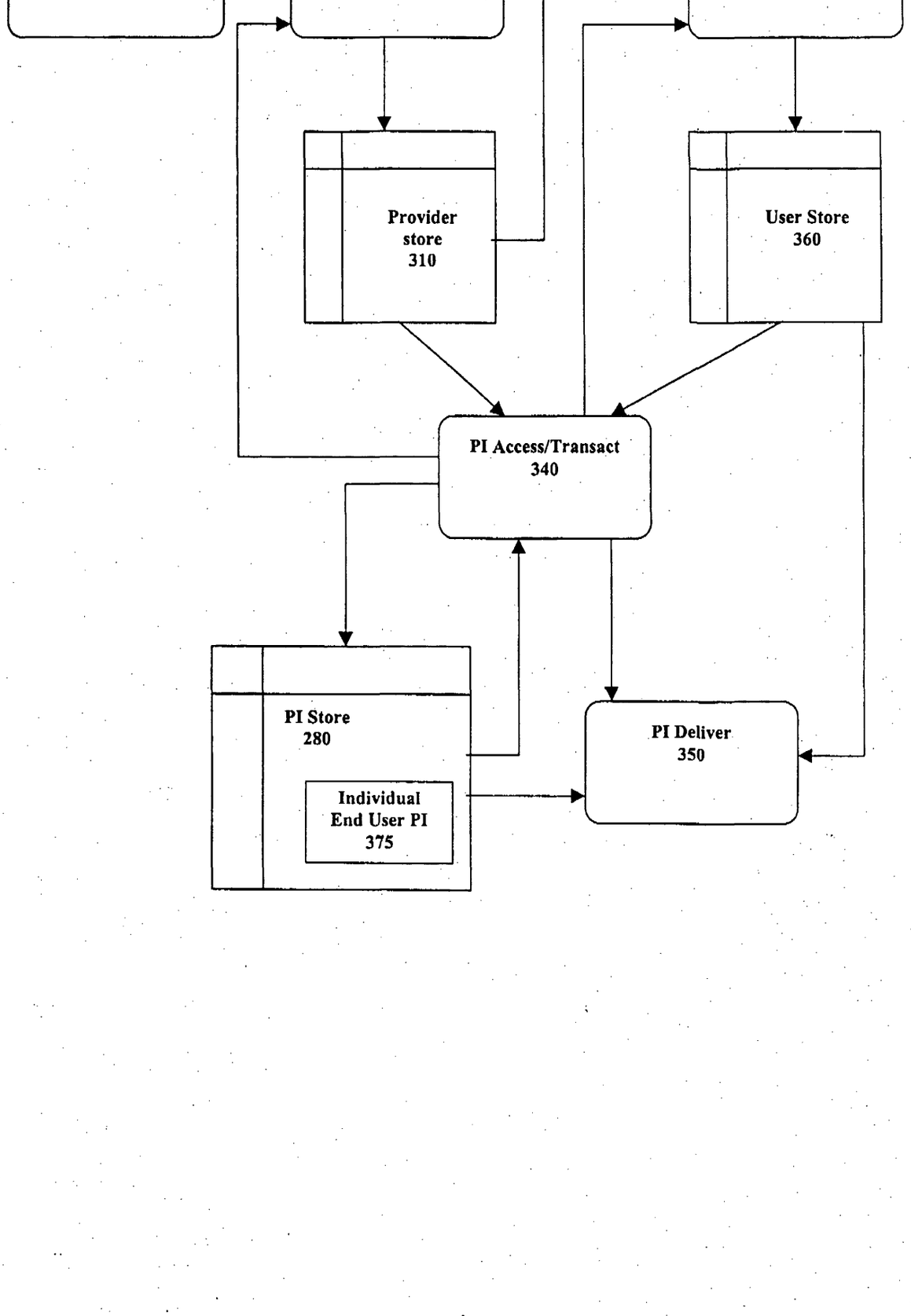

Figure 4
(Prior Art)

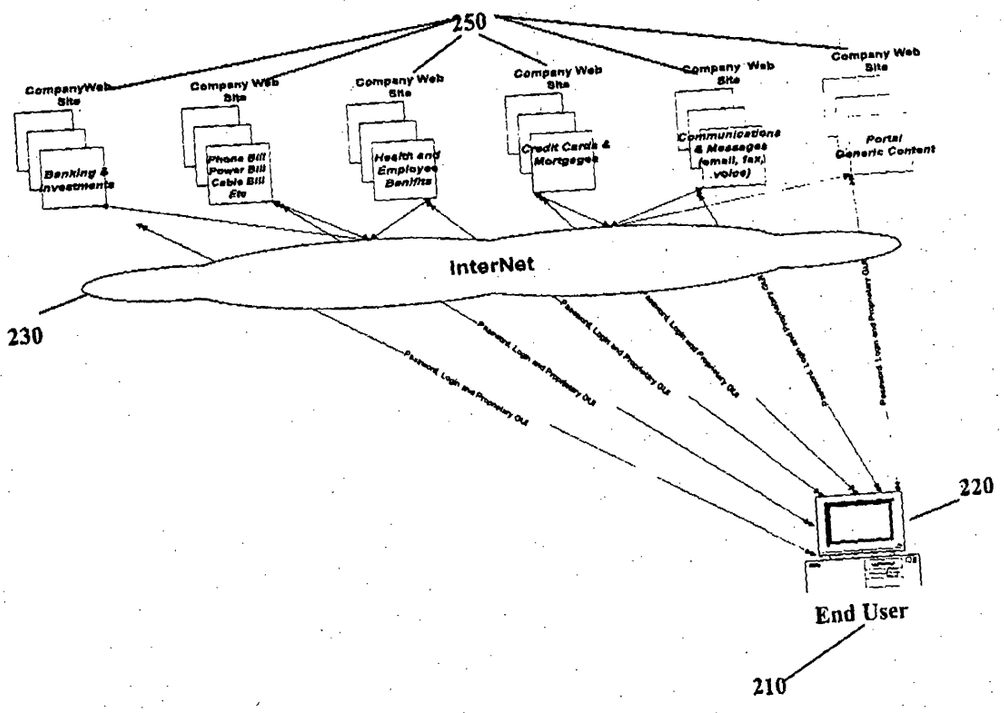

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Figure 5

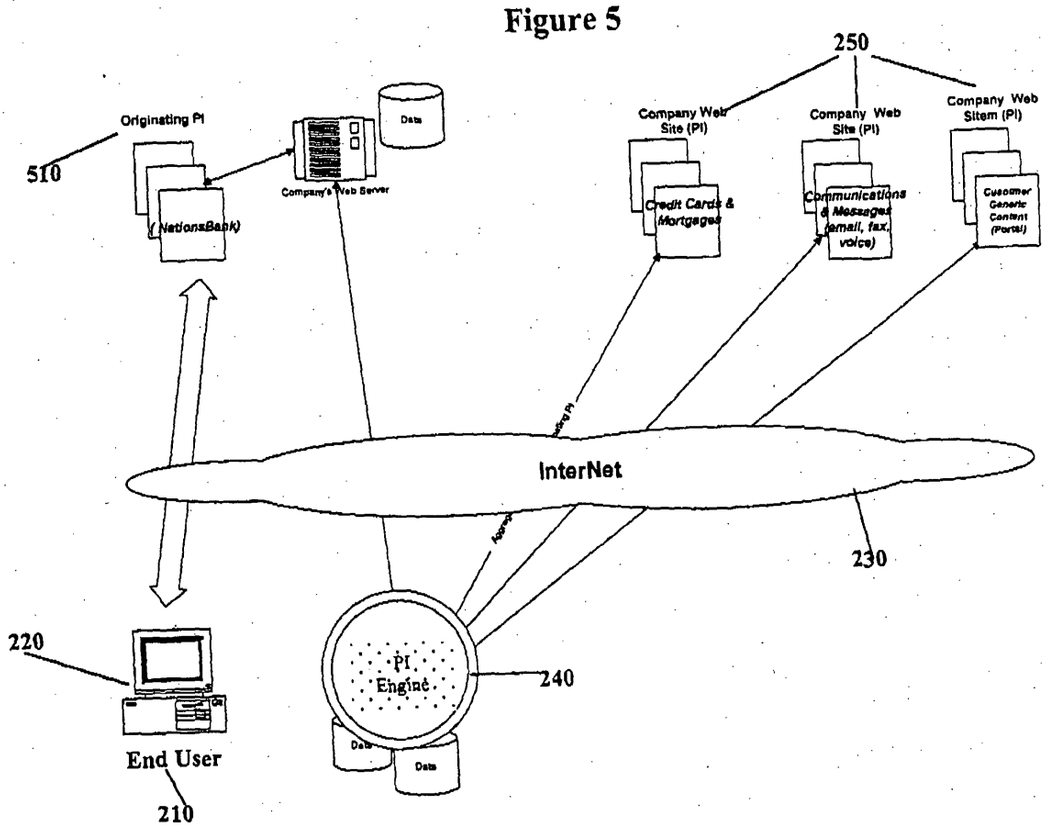

Figure 6

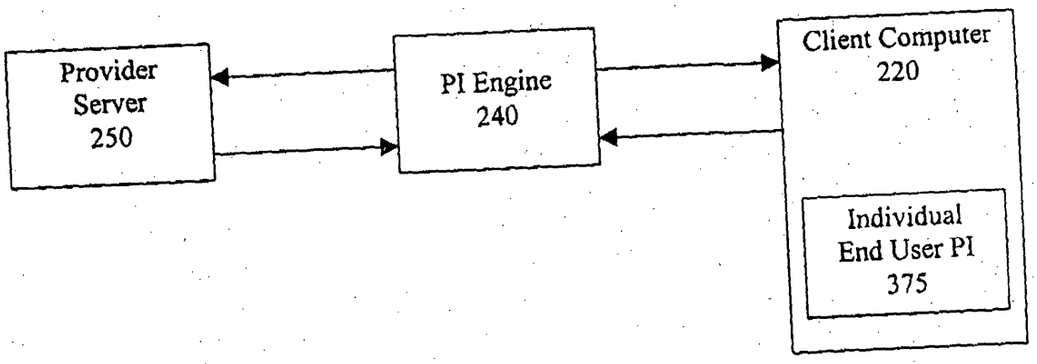

Figure 7

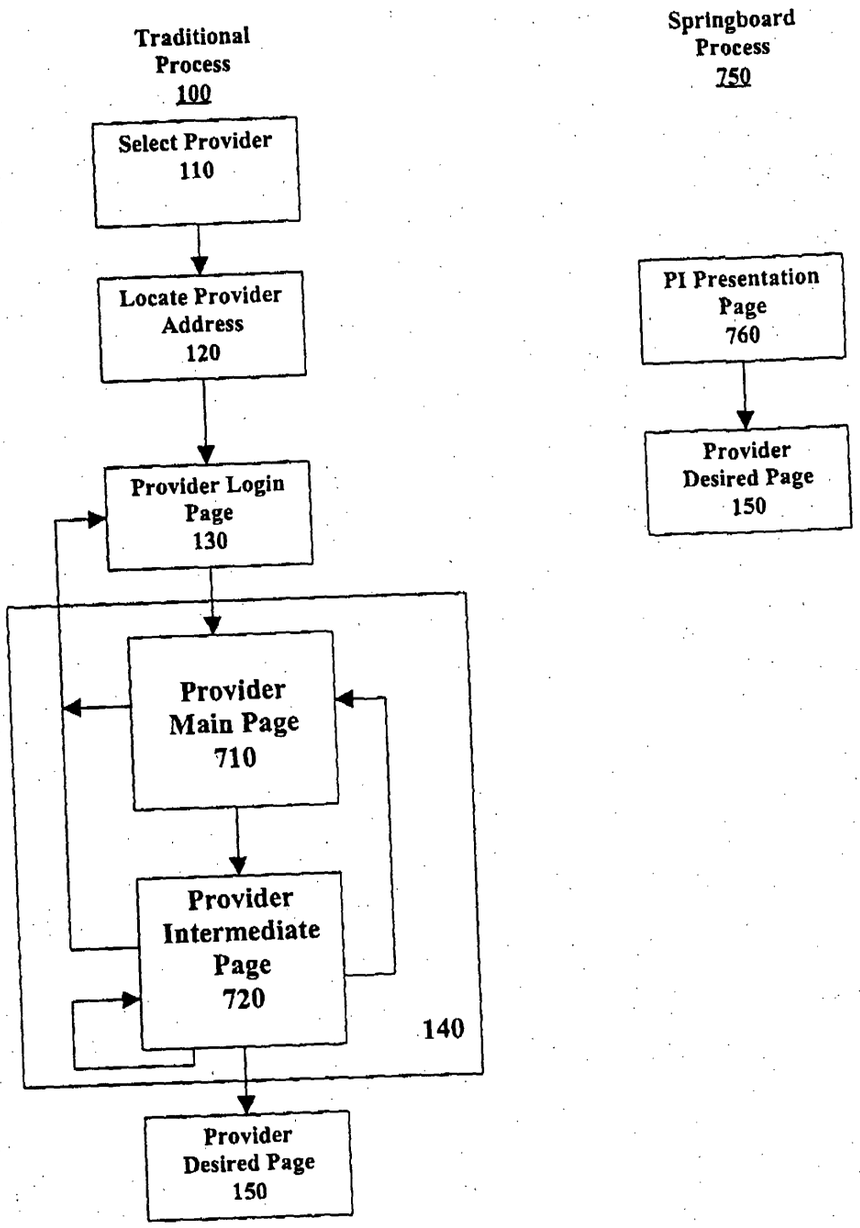

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Figure 8

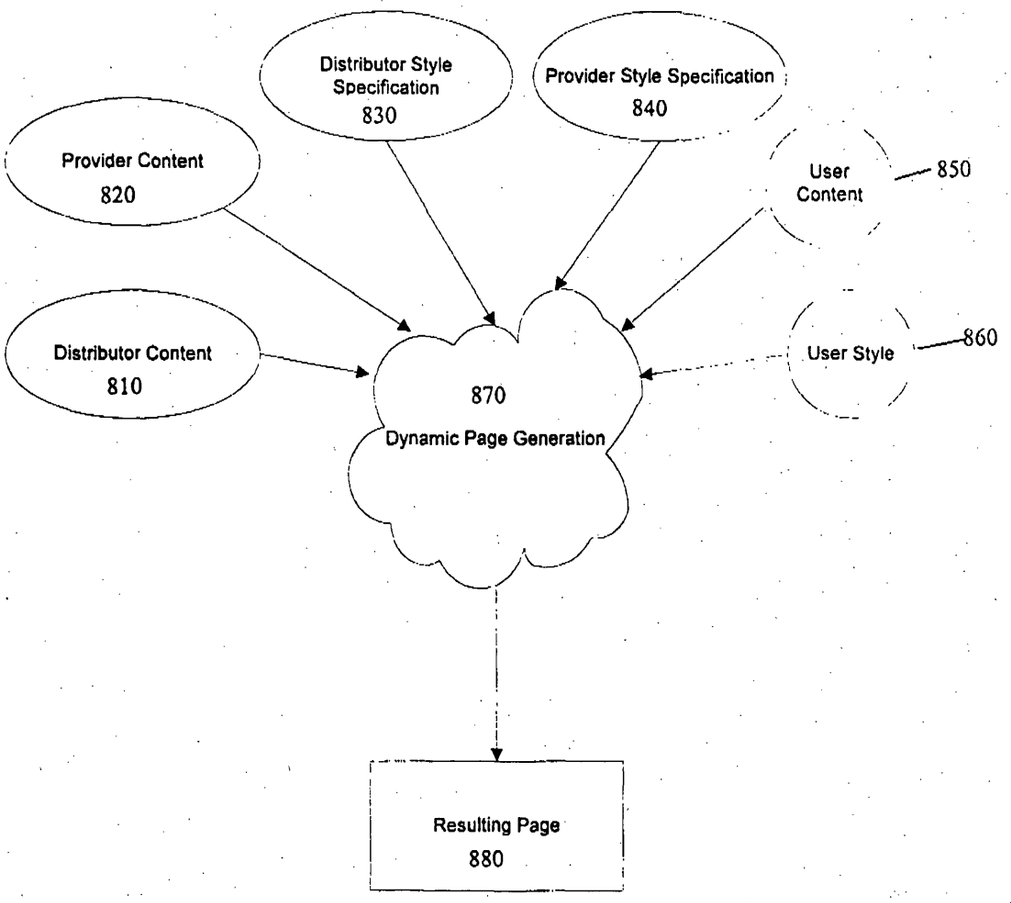

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Figure 9

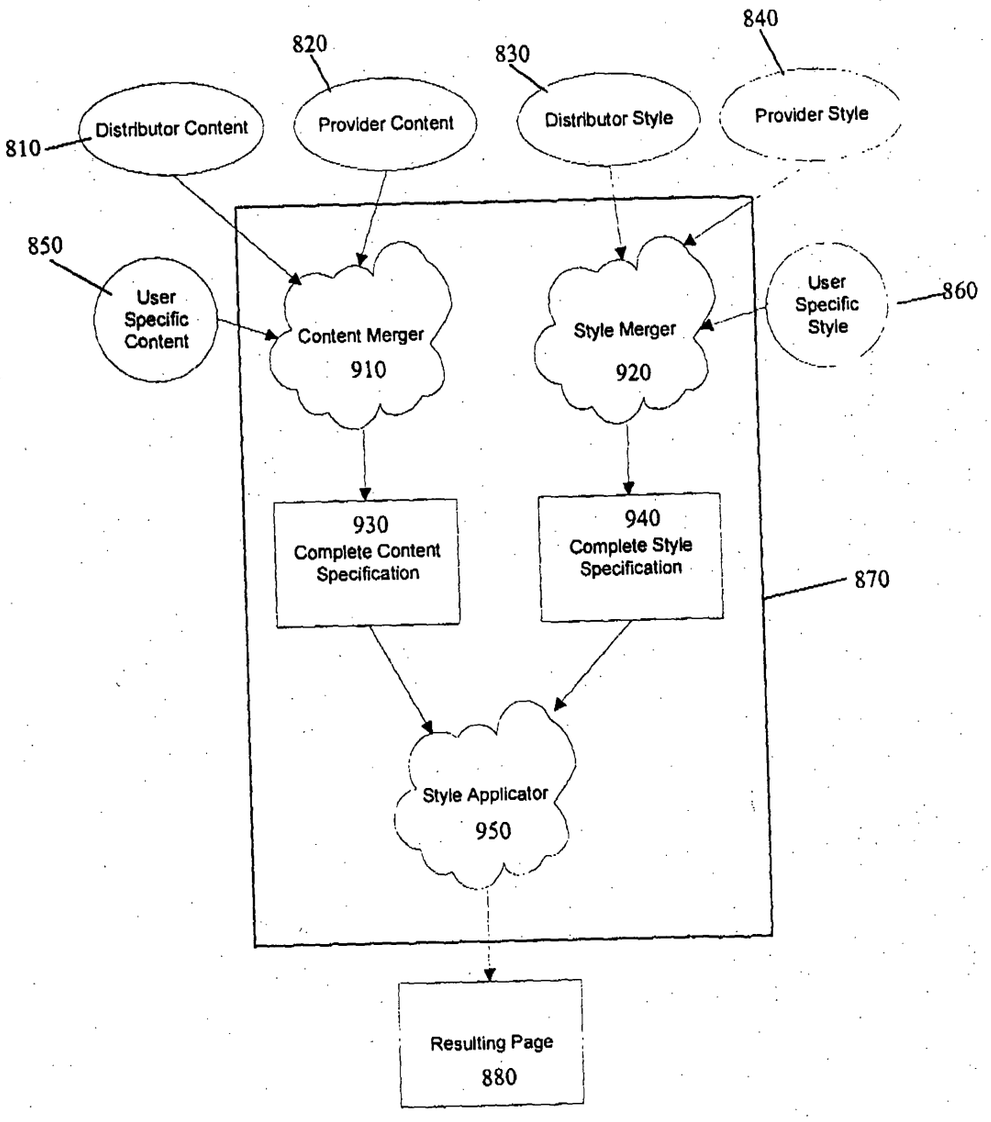

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Figure 10

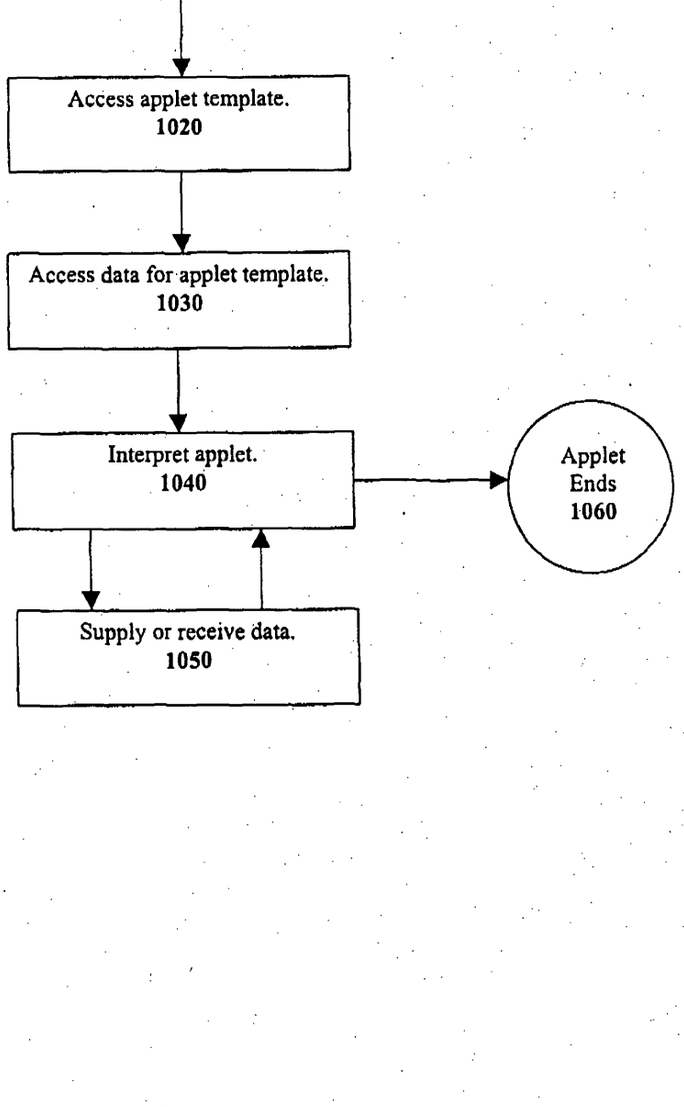
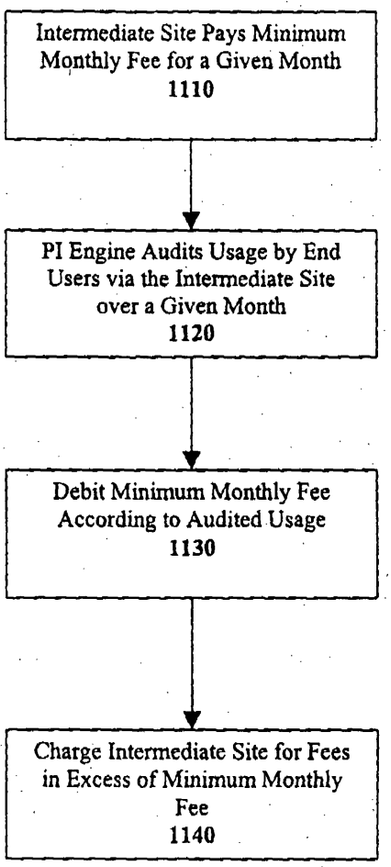


Figure 11



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APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
09/428,511	10/27/99	PROVISIONAL	

#2

0242/1127

NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

DATE MAILED:

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). **If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of ☐ $65.00 for a small entity in compliance with 37 CFR 1.27, or ☒ $130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.**

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☐ small entity (statement filed) ☒ non-small entity is $ 1034.00.

☒ 1. The statutory basic filing fee is:
- ☒ missing.
- ☐ insufficient.

Applicant must submit $ 760.00 to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

☐ 2. The following additional claims fees are due:

$ 144.00 for _____ total claims over 20.

$ _____ for _____ independent claims over 3.

$ _____ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☒ 3. The oath or declaration:
- ☒ is missing or unsigned.
- ☐ does not cover the newly submitted items.

An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the application by the above Application Number and Filing Date is required.

☐ 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

_____

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. **A $50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).**

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application was filed in a language other than English.
Applicant must file a verified English translation of the application, the $130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

☐ 9. OTHER: _____

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the reply.

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FORM PTO-1533 (REV. 9/98) U S GPO 1999 450-5875

PART 3 - OFFICE COPY

SECTOR 5

ATTORNEY DOCKET NO. 22022.0003
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)
)
Freishtat et al.) Group Art Unit: 2755
)
Serial No. 09/428,511) Examiner: Not Assigned
)
Filed: October 27, 1999)
)
For: "APPARATUS AND METHOD FOR)
AUTOMATED AGGREGATION AND)
DELIVERY OF AND TRANSACTION)
INVOLVING ELECTRONIC PERSONAL)
INFORMATION OR DATA")

RESPONSE TO NOTICE TO FILE MISSING PARTS

BOX MISSING PARTS
Assistant Commissioner for Patents
Washington, D.C. 20231

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

January 21, 2000

Sir:

In response to the November 23, 1999 Notice to File Missing Parts of Application-Filing Date Granted, enclosed are:

1. an executed Declaration;
2. a check in the amount of $1034.00 ($130.00 surcharge, $760.00 basic filing fee and $144.00 for total Claims over 20);
3. a copy of the Notice;
4. a copy of the Filing Receipt; and
5. a copy of the Cover Page of the Application.

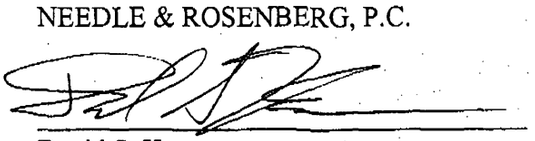
The Filing Receipt initially issued in the above-referenced case, a copy of which is enclosed, does not indicate the correct title. The cover page of the application as originally filed, a copy of which is enclosed, indicates the correct title with METHOD in singular. The Filing Receipt should indicate the title as "APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTION INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA".

Therefore, Applicants respectfully request that the Commissioner issue a corrected Filing Receipt that includes the above-listed correction. Because the correct title was provided to the Patent Office at the time of filing, and the error is therefore not Applicants', no additional fees are believed due for this correction.

Enclosed is a check in the amount of $1034.00 ($130.00 for surcharge, $760 basic filing fee and $144.00 for total Claims over 20). This amount is believed to be correct, however, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

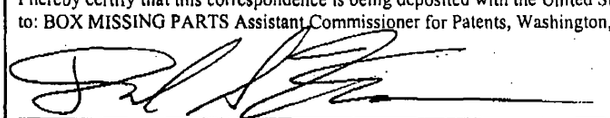
NEEDLE & ROSENBERG, P.C.



David S. Kerven
Registration No. 43,712

Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811
(404) 688-0770

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: BOX MISSING PARTS Assistant Commissioner for Patents, Washington, D.C. 20231, on this 21th day of January, 2000.



David S. Kerven

21 Jan 2000
Date

ATTORNEY DOCKET NO. 22022.0003

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

(X) Original () Supplemental () Substitute () PCT

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **"APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA"**, which is described and claimed in the specification

(check one) [] which is attached hereto, or
[X] which was filed on October 27, 1999, as United States Application No. 09/428,511 and with amendments through (if applicable), or
[] in International Application No. PCT/, filed , and as amended on (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information known by me to be material to the patentability of the claims of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119 (a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATIONS: (ENTER BELOW IF APPLICABLE)			PRIORITY CLAIMED (MARK APPROPRIATE BOX BELOW)	
APP. NUMBER	COUNTRY	DAY/MONTH/YEAR FILED	YES	NO

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

APPLICATION NUMBER	FILING DATE
60/134,395	May 17, 1999
60/105,917	October 28, 1998

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information known by me to be material to the patentability of the claims of this application as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO.	FILING DATE	STATUS (MARK APPROPRIATE COLUMN BELOW)		
		PATENTED	PENDING	ABANDONED

I hereby appoint the following attorneys and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

William H. Needle	Reg. No. 26,209	Jacqueline M. Hutter	Reg. No. P-44,792
Sumner C. Rosenberg	Reg. No. 28,753	Matthew D. Josephic	Reg. No. 43,699
David G. Perryman	Reg. No. 33,428	David S. Kerven	Reg. No. 43,712
Mitchell A. Katz	Reg. No. 33,919	Lori L. Kerber	Reg. No. 41,113
Gregory J. Kirsch	Reg. No. 35,572	Janice A. Kimpel	Reg. No. 42,734
Gwendolyn D. Spratt	Reg. No. 36,016	Tina W. McKeon	Reg. No. 43,791
Nagendra Setty	Reg. No. 38,300	Mary L. Miller	Reg. No. 39,303
D. Andrew Floam	Reg. No. 34,597	Mark A. Murphy	Reg. No. 42,915
William R. Johnson	Reg. No. 32,875	Lance D. Reich	Reg. No. 42,097
Allan G. Altera	Reg. No. 40,274	Lisa A. Samuels	Reg. No. 43,080
Bryan W. Bockhop	Reg. No. 39,613	Clark G. Sullivan	Reg. No. 36,942
John L. Capone	Reg. No. 41,656	Lawrence A. Villanueva	Reg. No. 43,968
Kean J. DeCarlo	Reg. No. 39,954	Mitchell G. Weatherly	Reg. No. 40,864
LaVonda R. DeWitt	Reg. No. 40,396	Tim T. Xia	Reg. No. 45,242

Address all telephone calls to Gregory J. Kirsch at telephone no. (404) 688-0770.

Address all correspondence to:

Gregory J. Kirsch, Esq.
NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.

Atlanta, Georgia 30303-1811

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor: Gregg Freishtat

Inventor's signature: _____ Date: 1/5/00

Residence: 5860 Winterthur Drive, Atlanta, Georgia 30326

Post Office Address: 5860 Winterthur Drive, Atlanta, Georgia 30326

Citizenship: U.S.A.

Full name of second inventor: Palaniswamy Rajan

Inventor's signature: Rajan P.N Date: 1/7/2000

Residence: 6917D Roswell Road, Atlanta, Georgia 30328

Post Office Address: 6917D Roswell Road, Atlanta, Georgia 30328

Citizenship: INDIA

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
09/428,511	10/27/99	FREISHTAT	2201.2.000

0242/1122

NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

DATE MAILED:

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). **If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of ☐ $65.00 for a small entity in compliance with 37 CFR 1.27, or ☒ $130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.**

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☐ small entity (statement filed) ☒ non-small entity is $ 1034.00.

☒ 1. The statutory basic filing fee is:
- ☒ missing.
- ☐ insufficient.

Applicant must submit $ 760.00 to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

☐ 2. The following additional claims fees are due:

$ 144.00 for _____ total claims over 20.

$ _____ for _____ independent claims over 3.

$ _____ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☒ 3. The oath or declaration:
- ☐ is missing or unsigned.
- ☒ does not cover the newly submitted items.

An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the application by the above Application Number and Filing Date is required.

☐ 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

_____

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. **A $50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).**

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application was filed in a language other than English.
Applicant must file a verified English translation of the application, the $130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

☐ 9. OTHER: _____

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the reply.

M. Middleton
Customer Service Center
Initial Patent Examination Division (703) 308-1202

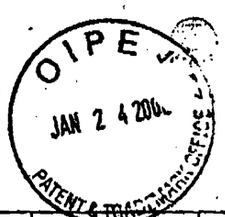
01/28/2000 MBERHE 00000077 09428511
01 FC:101 760.00 OP
02 FC:105 130.00 OP
03 FC:103 144.00 OP

FORM PTO-1533 (REV. 9/98) U.S. GPO 1999 450-5875

PART 2 - COPY TO BE RETURNED WITH RESPONSE

)-103X
v. 6-99)

FILING RECEIPT



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/428,511	10/27/99	2755	$0.00	22022.0003	11	28	3

NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

RECEIVED
NOV 2 9 1999
NEEDLE & ROSENBERG

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts of Application" ("Missing Parts Notice") in this application, please submit any corrections to this Filing Receipt with your reply to the "Missing Parts Notice." When the PTO processes the reply to the "Missing Parts Notice," the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s) GREGG FREISHTAT; PALANISWAMY RAJAN.

CONTINUING DATA AS CLAIMED BY APPLICANT-
PROVISIONAL APPLICATION NO. 60/105,917 10/28/98
PROVISIONAL APPLICATION NO. 60/134,395 05/17/99

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 11/18/99
TITLE
APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

PRELIMINARY CLASS: 709

GJK|DSK

DOCKETED
By: [illegible] Date: 11-29-99
Reviewed: DSK 8 Dec 1999
Name/Date

DATA ENTRY BY: MIDDLETON, MATTIE TEAM: 04 DATE: 11/18/99

(See reverse for new important information)

2-10-00

DA C 4

Attorney Docket No. 22022.0003
Utility Patent Application

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#4 4.18.00 JB

In re Application of	)	
	)	
Freishtat et al.	)	
	)	
Serial No.: 09/428,511	)	Group Art Unit: 2755
	)	
Filed: October 27, 1999	)	Examiner: Unassigned
	)	
For: "APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA"	)	

PETITION TO MAKE SPECIAL

Commissioner of
Patents and Trademarks
Washington, D.C. 20231

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

February 8, 2000

Dear Sir or Madam:

Pursuant to 37 C.F.R. § 1.102, applicants petition the Commissioner to make the above-identified patent application special so that it may be taken out of turn for action immediately.

In support of this Petition, enclosed herewith is a Declaration of Gregory J. Kirsch, an undersigned attorney of record, setting forth in compliance with M.P.E.P. § 708.02 II that he

believes that the invention sought to be patented in this application is being infringed and a search for the claimed subject matter has been conducted.

M.P.E.P. § 708.02 II requires that a prior art search be conducted, which has been satisfied here in three ways. First, applicants commissioned an independent search of the prior art prior to filing the parent application, as detailed in the Declaration of Mr. Kirsch. Second, a search was conducted by the U.S. Patent Office with regard to a co-pending PCT application including claims directed to the subject matter of the above-identified application. Finally, these searches were supplemented by an internal search of non-patent prior art, as detailed in the Declaration of Mr. Kirsch. In the above-identified application, applicants are citing all references disclosed in these searches in an Information Disclosure Statement, filed concurrently herewith.

Applicants' pending claims are being infringed by a third-party, as also detailed in the enclosed Declaration of Mr. Kirsch. Obviously, applicants require a patent in order to appropriately handle such infringement. To enable the Examiner to consider this application expeditiously and to facilitate the processing of this application by the Patent and Trademark Office, this Petition to Make Special is being filed. Applicants respectfully request that this Petition be granted.

PETITION TO MAKE SPECIAL
Attorney Docket No. 15060.0018
Serial No.: 09/441,841

Enclosed is a check for $130.00 as required under 37 C.F.R. § 1.17(i). No additional fees are believed due at this time; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

NEEDLE & ROSENBERG, P.C.

Gregory J. Kirsch
Reg. No. 35,572

NEEDLE & ROSENBERG, P.C.
Suite 1200, 127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811
(404) 688-0770

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. EL403199748US addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on February 8, 2000.

Everardo McFarlane — Date: 2-8-2000

Attorney Docket No. 22022.0003
Utility Patent Application

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	
	)	
Freishtat et al.	)	
	)	
Serial No.: 09/428,511	)	Group Art Unit: 2755
	)	
Filed: October 27, 1999	)	Examiner: Unassigned
	)	
For: "APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA"	)	

DECLARATION OF GREGORY J. KIRSCH PURSUANT TO 37 C.F.R. § 1.102

Commissioner of
Patents and Trademarks
Washington, D.C. 20231

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

February 8, 2000

I, Gregory J. Kirsch, declare that:

1. I am registered to prepare and prosecute patent applications before the U.S. Patent and Trademark Office and am an attorney of record for the above-identified application. My registration number is 35,572.

2. I submit this declaration in support of the accompanying Petition to Make Special, which is filed pursuant to 37 C.F.R. § 1.102 and M.P.E.P. § 708.02 II.

3. I have personally reviewed a product/service entitled yodlee.com that is actually on the market for aggregation and delivery of electronic personal information. Yodlee.com is provided through the World Wide Web by Yodlee, Inc. (Sunnyvale, California). Yodlee.com provides this product/service via a Web site with the following Internet address:

www.yodlee.com

4. I have rigidly compared the pending claims in the above-identified application with the specific product/service listed in the above paragraph. I believe that at least some of the claims of this application are actually infringed by the development, use, sale, and/or commercialization of this product.

5. As an attorney of record for the above-identified patent application, I have caused to be made a careful and thorough search of the prior art relevant to the claimed subject matter.

6. The first search that was conducted for the above-identified application was commissioned shortly after filing the patent application on October 27, 1999. The search was performed by the patent search firm of Laubscher & Laubscher ("Laubscher search"). On December 22, 1999, the search firm was provided with a copy of PCT application PCT/US99/25181, containing a specification with claims directed to the same subject matter as claimed in the above-identified patent application.

7. The Laubscher search was conducted in the U.S. Patent and Trademark Office Public Search Room. The field of search covered class 705, subclasses 10 and 26, and class 709, subclasses 213, 217, 218, and 219. In addition to a complete search of the above subclasses, the searcher consulted with Examiners Cardone and Rinehart of Group 2787, who confirmed that the most pertinent search areas were covered by the subclasses searched. The manual search was supplemented with a computerized search of the WEST database maintained by the U.S. Patent Office. The Laubscher search resulted in the following thirteen patents: U.S. Patent No. 5,710,887 to Chelliah *et al.*; U.S. Patent No. 5,825,884 to Zdepski; U.S. Patent No. 5,860,068 to Cook; U.S. Patent No. 5,884,045 to Kurihara; U.S. Patent No. 5,895,468 to Whitmyer, Jr.; U.S. Patent No. 5,918,214 to Perkowski; U.S. Patent No. 5,926,798 to Carter; U.S. Patent No. 5,956,709 to Xue; U.S. Patent No. 5,963,915 to Kirsch; U.S. Patent No. 5,978,766 to Luciw; U.S. Patent No. 5,983,200 to Slotznick; U.S. Patent No. 5,983,227 to Nazem *et al.*; and U.S. Patent No. 5,987,498 to Athing *et al.* Copies of these patents are being cited in the Information Disclosure Statement filed concurrently herewith for the above-identified application.

8. In addition to the Laubscher search of the prior art, a search was conducted by the U.S. Patent Office in conjunction with PCT application PCT/US99/25181, containing essentially the same specification as the above-identified patent application with claims directed to the same subject matter as claimed in the above-identified patent application (PCT search). An International Search Report issued on this application on January 18, 2000. According to Ahmad Matar, the individual listed on the search report as the authorized officer, the search was

conducted by Examiner Phillip Tran of Group Art Unit 2758. The field of search covered class 705, subclass 10, and class 709, subclasses 203 and 217. This search was supplemented by a search of documentation of the IEEE and a search of the WEST database. The PCT search resulted in the following three patents: U.S. Patent No. 5,991,735 to Gerace; U.S. Patent No. 5,983,227 to Nazem *et al.*; and U.S. Patent No. 5,878,219 to Vance, Jr. *et al.* Copies of these patents are being cited in the Information Disclosure Statement filed concurrently herewith for the above-identified application.

9. Finally, a third search was conducted by Dr. David S. Kerven, an attorney of record in the above-identified application. Dr. Kerven's search was conducted in the Association for Computing Machinery's digital library (ACM search). The ACM search resulted in the following three references: "Strategic Directions in Database Systems - Breaking Out of the Box," Avi Silberschatz, and Stan Zdonik et al., ACM Computing Surveys. Vol. 28, No. 4, pp. 764-778, December (1996); "Database Security and Privacy," Sushil Jajodia, ACM Computing Surveys, Vol. 28, Issue 1, pp. 129-131, March (1996); and "Managing Security and Privacy of Information," Sushil Jajodia, ACM Computing Surveys, Vol. 28, No. 4es, December (1996). Copies of these references are being cited in the Information Disclosure Statement filed concurrently herewith for the above-identified application.

10. Accordingly, there have been three searches performed for the subject matter claimed in the above-identified patent application: the Laubscher search, the PCT search and the ACM search.

11. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent issuing therefrom.

8 FEB 2000
Date

Gregory J. Kirsch

CLERK DO NOT UPDATE PETITIONS DATABASE

2700
PETITION
ROUTING SLIP

(DO NOT REMOVE FROM APPLICATION FILE)

Application No.: 09428511 Assigned To: Hayes, Jennifer

Art Unit: 2700

Type: **37 CFR 1.102(d) - Accelerated Examination**

Due Date: 03-May-00
4/24/00 JMH

SPRE Receipt Date:

Date Received For Decision:_____

Mailroom Date: 08-Feb-00

Please return this application with a draft decision to the Special Program Center on or before the "Due Date" indicated above.

Questions regarding petitions before the directors of Technology Center 2700 should be directed to:

Jim Groody	Vin Trans	Ken Wieder
SPRE	SPRE	SPRE
PK2-8A35	PK2-8A37	PK2-8A33
308-5461	305-9750	305-4710

Special Program Database, Version 2.0 Routing Slip Printed On: Tuesday, April 18, 2000 6:01:03 PM

#5
4.18.00
CB

Attorney Docket No. 22022.0003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)
)
Freishtat et al.)
)
Serial No.: 09/428,511) Group Art Unit: 2755
)
Filed: October 27, 1999) Examiner: Unassigned
)
For: "APPARATUS AND METHOD FOR)
AUTOMATED AGGREGATION AND)
DELIVERY OF AND TRANSACTIONS)
INVOLVING ELECTRONIC PERSONAL)
INFORMATION OR DATA")

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

February 8, 2000

Sir:

Submitted herewith on form PTO 1449 is a listing of documents known to applicants and/or their attorneys in compliance with the requirements of 37 C.F.R. § 1.56. Copies of these documents are enclosed.

Applicants would also like to inform the Examiner of the following co-pending and commonly assigned, related applications, also filed on October 27, 1999:

09/427,787
09/427,602
09/427,601
09/427,811
09/427,790
09/427,794

Consideration of the cited documents and making the same of record in the prosecution of the above-noted application are respectfully requested.

Respectfully submitted,

NEEDLE & ROSENBERG, P.C.

Gregory J. Kirsch
Registration No. 35,572

Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811
(404) 688-0770

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. EL403199745US addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on this 8th day of February, 2000.

Everardo McFarlane

2-8-2000
Date

#5

ATTORNEY DOCKET NO. 22022.0003
SERIAL NO. 09/428,511
Page 1 of 2

OIPE JC37 FEB 08 2000 PATENT & TRADEMARK OFFICE

Form PTO-1449
U.S. DEPARTMENT OF COMMERCE (Rev. 7-80)
PATENT AND TRADEMARK OFFICE

LIST OF PRIOR ART CITED BY APPLICANT
(Use several sheets if necessary)

ATTORNEY DOCKET NO.: 22022.0003 | SERIAL NO. 09/428,511

APPLICANT: Freishtat et al.

FILING DATE: October 27, 1999 | GROUP: ~~2755~~ 2154

RECEIVED FEB 03 2000 Technology Center 2100

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
IHC	AA	5,991,756	11/23/99	Wu	707	3	Nov. 3, 1997
	AB	5,991,735	11/23/99	Gerace	705	10	Aug. 11, 1998
	AC	5,987,498	11/16/99	Athing et al.	709	203	Feb. 16, 1996
	AD	5,983,227	11/9/99	Nazem et al.	707	10	Jun. 12, 1997
	AE	5,983,200	11/9/99	Slotznick	705	26	Oct. 6, 1997
	AF	5,978,766	11/2/99	Luciw	705	1	Dec. 20, 1995
	AG	5,963,915	10/5/99	Kirsch	705	26	Feb. 21, 1996
	AH	5,956,709	9/21/99	Xue	707	3	Jul. 28, 1997
	AI	5,926,798	7/20/99	Carter	705	26	Jun. 6, 1997
	AJ	5,918,214	6/29/99	Perkowski	705	27	Oct. 25, 1996
	AK	5,898,836	4/27/99	Freivald et al.	~~395~~ 709	~~200.48~~ 216	Jan. 14, 1997
	AL	5,895,468	4/20/99	Whitmyer, Jr.	707	10	Oct. 7, 1996
	AM	5,894,554	4/13/99	Lowery et al.	~~395~~ 709	~~200.33~~ 203	Apr. 23, 1996
	AN	5,884,045	3/16/99	Kurihara	~~395~~ 709	~~200.67~~ 237	Jul. 10, 1995
	AO	5,878,219	3/2/99	Vance, Jr. et al.	~~395~~ 709	~~200.47~~ 217	Mar. 12, 1996
	AP	5,860,068	1/12/99	Cook	705	26	Dec. 4, 1997
	AQ	5,825,884	10/20/98	Zdepski et al.	~~380~~ 705	~~25~~ 78	Jul. 1, 1996
	AR	5,710,887	1/20/98	Chelliah et al.	~~395~~ 705	~~226~~ 26	Aug. 29, 1995
	AS	5,699,528	12/16/97	Hogan	~~395~~ 705	~~240~~ 40	Oct. 31, 1995
IHC	AT	5,655,089	8/5/97	Bucci	~~395~~ 705	~~240~~ 40	Apr. 10, 1992

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

IHC	AU	"Strategic Directions in Database Systems - Breaking Out of the Box," Avi Silberschatz, and Stan Zdonik et al., ACM Computing Surveys, Vol. 28, No. 4, pp. 764-778, December (1996).
IHC	AV	"Database Security and Privacy," *Sushil Jajodia*, ACM Computing Surveys, Vol. 28, Issue 1 pp. 129-131, March (1996).

H:\apps\ss\docs\dsk\W048512.WPD

MAC	AW	"Managing Security and Privacy of Information," *Sushil Jajodia*, ACM Computing Surveys, Vol. 28, Issue 4es, December (1996).
MAC	AX	"Today's Style Sheet Standards: The Great Vision Blinded," *Philip M. Marden, Jr. and Ethan V. Munson*, IEEE Computer, pp. 123-125, November (1999)

EXAMINER: Kenneth R. Coulter | DATE CONSIDERED: 8/27/02

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

H:\apps\ss\docs\dsk\W048512.WPD

Strategic Directions in Database Systems—Breaking Out of the Box

AVI SILBERSCHATZ

Bell Laboratories, Murray Hill, NJ (avi@bell-labs.com)

STAN ZDONIK ET AL.[1]

Brown University, Providence, RI 02912 (sbz@cs.brown.edu)

1. INTRODUCTION

The field of database systems research and development has been enormously successful over its 30-year history. It has led to a $10 billion industry with an installed base that touches virtually every major company in the world. It would be unthinkable to manage the large volume of valuable information that keeps corporations running without support from commercial database management systems (DBMSs).

Today, the field of database research is largely defined by its previous successes, and much current research is aimed at increasing the functionality and performance of DBMSs. A DBMS is a very complex system incorporating a rich set of technologies. These technologies have been assembled in a way that is ideally suited for solving problems of large-scale data management in the corporate setting. However, a DBMS, like any large tool, places some requirements on the environment in which it is being used. The DBMS imposes some execution overhead, often requires a fairly high level of expertise to install and maintain, and only manages data that is in fairly specific file formats.

At the same time, the data that needs managing is changing radically and is being stored in places other than database systems (e.g., files). It is also obtained in large volumes from external sources, like sensors. While the trend of building more powerful database management systems has a place, there is also a need for data management in contexts that cannot cope with the overhead of a full-blown DBMS; many environments call for a much lighter-weight solution.

Sometimes, instead of using an existing tool in a new application, it is better to embed reusable components in order to make the resulting system more responsive. In some cases, it is the techniques that a tool embodies that are most reusable. We argue that this observation is true in many new data-intensive applications. We would like to reuse database system components, but when that is inappropriate we must be willing to reuse our techniques and our experience in new ways.

If we look around at information that people use, we see many examples in which database systems are conspicuous by their absence. One of the most

[1] Participants in this workshop were José Blakeley, Peter Buneman, Umesh Dayal, Tomasz Imielinski, Sushil Jajodia, Hank Korth, Guy Lohman, Dave Lomet, Dave Maier, Frank Manola, Tamer Ozsu, Raghu Ramakrishnan, Krithi Ramamritham, Hans Schek, Avi Silberschatz (co-chair), Rick Snodgrass, Jeff Ullman, Jennifer Widom, and Stan Zdonik (co-chair).

compelling examples is the World Wide Web. While it is true that DBMS vendors are making their products *web-enabled*, their approach is to provide better web servers. This capability is only a very small step in the direction of managing the huge volume of nonstandard data that exists on the Web. It is doubtful that this move will cause the hundreds of thousands of web sites to shift to the use of a full-featured database system whose target market is business data processing.

Other examples of applications that could benefit from data management techniques, but typically do not make heavy use of database products include personal information systems, news services, and scientific applications. In the case of personal information systems, one only has to think about the information found on the typical PC. Electronic mail is of great personal value to many users, but when messages are saved, they are most often stored in the file system. It would be extremely useful to have DBMS facilities such as indexing and querying available for use on email. While some support for a more organized approach to storage and retrieval of email is emerging (e.g., Lotus Notes), sophisticated querying is not well developed.

Other recent reports [Gray 1995; Silberschatz et al. 1991; Silberschatz et al. 1995] have charted the course of database research, and have done an excellent job prioritizing current research topics and delineating new influences with respect to their impact on the database system industry. This report takes a somewhat different tack. Our theme is that database research should be devoted to the problems of data management no matter where and in what form the data may be found. We should not be defined strictly by the current product space or by the commonly held notion that our job is to manage very large collections of structured records within a controlled environment. Instead, we should apply our skills to new data-management environments that potentially require radically new software architectures.

2. BACKGROUND

The database field was born in the late 1960s with the release of IMS, an IBM product that managed data as hierarchies. While hierarchies later proved too restrictive, the key contribution of IMS was the widespread revelation that data has value and should be managed independently of any single application. Previously, applications owned private data files that often duplicated data from other files. With a DBMS, data need not be logically replicated, making it easier to maintain. Creating shared databases required analysis and design that balanced the needs of multiple applications, thereby improving the overall management of data resources.

Both the IMS data model and its best known successor, CODASYL, were based on graph-based data structures. While the idea of traversing links was intuitively attractive, it made it difficult to express database interactions independently of the actual algorithms that are needed to implement them.

In 1970, Ted Codd published a landmark paper [Codd 1970] that suggested that data could be managed at a much higher level by conceptualizing it in terms of mathematical relations. Throughout the 1970s, this paper sparked a great deal of interest within the research community to make this notion practical. The relational model is now most commonly supported among commercial database vendors.

Because of the relational model's simplicity and clean conceptual basis, an active theoretical community developed around it. This community has contributed many important results including database design theory, a theory of query language expressibility and complexity, and an extension to relational languages called Datalog. Theoretical work continues in many forms, including constraint databases and queries with incomplete information.

In the early 1980s, a new data model emerged, based on object-oriented programming principles. The object-oriented data model was the first attempt at providing an extensible data model. Data abstraction was used to let users create their own application-specific types that would then be managed by the DBMS. In the last five or six years, several object-oriented database companies have emerged, and a committee made up of vendor representatives has produced a standard (ODMG). More recently, a hybrid model, commonly known as the object-relational model, has emerged that embeds object-oriented features in a relational context.

The use of objects has also been demonstrated as a way to achieve both interoperability of heterogeneous databases and modularity of the DBMS itself. The object model provides very powerful tools for creating interfaces that do not depend on representational details. Heterogeneity in object representations can be paved over by overlaying an object-oriented schema on top of the actual stored data. DBMS modules can be described in object-oriented terms, making them easier to export to other systems.

3. OUR SKILLS

Database management systems have been largely concerned with the problems of performance, correctness, maintainability, and reliability. High performance must be achievable even when the volume of data is far greater than what fits in physical memory, and even when the data is distributed across multiple machines. Correctness is achieved by the enforcement of integrity constraints (e.g., referential integrity) and by serializable transactions. Maintainability is achieved by separation of logical and physical data structures, as well as by a large collection of tools to facilitate such functions as database design and system performance. Reliability is typically provided by combining a mechanism such as write-ahead logging with transactions that can maintain data consistency in the face of hardware and software failures.

Database research and development has explored these problems from the point of view of relatively slow-memory devices that must be shared by multiple concurrent users. Database systems have also developed in contexts where there is no control over the execution of their clients. This approach has led to a particular set of skills and techniques (described below) that can be applied and extended to other problems.

Data modeling. A *data model* consists of a language for defining the structure of the database (data definition language) and a language for manipulating those structures (data manipulation language, e.g., a query language). A *schema* defines a particular database in terms of the data definition language. By requiring that all data be described by a schema, a DBMS creates a separation between the stored data structures and the application-level abstractions. This *data independence* facilitates maintenance, since stored structures can be changed without any impact on applications.

A good data model should be sufficiently expressive to capture a broad class of applications, yet should be efficiently implementable. While the relational model has dominated the field for the last decade, there is clear indication that more powerful and flexible models are required. The design and use of data models are important topics of study within the database community, and the extension of these models to incorporate more challenging types such as spreadsheets and videostreams is an important line of study for future applications.

Query languages. A query is a program written in a high-level language to retrieve data from the database. The structure of a database query is

relatively simple, making it easy to understand, generate automatically, and optimize. Many modern query languages (e.g., SQL) are declarative, in that they express what should be returned from the database without any reference to storage structures or the algorithms that access these structures. Since implementation choices cannot show through at the query level, the query processor is free to choose an evaluation strategy. Moreover, the separation of request from implementation means that the storage structures can change without invalidating existing query expressions.

Query optimization and evaluation. Relational databases became a commercial reality because of the maturation of optimizers for relational query languages and the development of efficient query-evaluation algorithms. The ability to compile queries into a query execution plan based on the form of the query as well as the current storage structures on the disk is an important part of database system development. Optimization technology is particularly important for data retrieval and manipulation whenever the stakes of picking an inefficient strategy are high and the environmental conditions on which the execution plan are based may change.

State-based views. It is possible to define a restricted and possibly reorganized view of the database using the query language. These state-based views are often used to limit the access to data. For example, we can limit use to a view containing the average salary by departments, excluding departments with fewer than three employees. In file systems, authorization is typically handled by access privileges associated with each file independent of its contents.

Data management. Database systems have always paid special attention to the automatic maintenance of data structures like indices and the efficient movement of data to and from system buffers. Typically these data management techniques are highly tuned for the particular storage devices involved. This approach to careful resource usage can be extended to other areas in which the devices include things like communication links and tertiary storage.

Transactions. The database community developed the notion of transactions as a response to correctness problems introduced by concurrent access and update. By adopting a correctness criterion based on atomicity, transactions simplify programming—since the programmer need not worry about interference from other programs.

The transaction has also been used as the unit of recovery. Once a transaction is committed, it is guaranteed to be permanent even in the presence of any hardware or software failure.

Recently, other looser notions of transaction have been investigated. These typically are based on a user-supplied notion of correctness.

Distributed systems. Database systems must deal with the problems introduced by having data distributed across multiple machines. The *two-phase commit* protocol allows systems to retain the advantages of atomic transactions in the face of distributed and possibly failure-prone activities. Other areas that have been studied in the distributed context include query processing, deadlock detection, and integration of heterogeneous data.

Scalable systems. Database have always been concerned with very large data sets. For the most part, database systems have been tuned to efficiently and reliably handle data volumes that exceed the size of the physical memory by several orders of magnitude. It is primarily for this reason that database systems have been successful in real commercial environments.

This list is not meant to be exhaustive, but rather illustrates some of the major technologies that have been developed by database research and development. Researchers have investigated other areas as well, including active databases and data mining.

4. SCENARIOS

In this section we describe two applications of database technology that illustrate the directions we are advocating in this report. These are meant to be suggestive only. We believe the capabilities represented here point the way for future data management systems, and that the technology to support these scenarios constitutes a research agenda for the next decade.

4.1 Instant Virtual Enterprise

An "instant virtual enterprise" (IVE) is a group of companies that do not routinely function as a unit, coming together to respond to a customer order or request for proposal. Computer-integrated manufacturing (CIM) is a prominent example of an environment requiring IVE cooperation. The CIM environment encompasses many dedicated departments and subsystems. The engineering side includes computer-aided design, production, and quality assurance, while the administrative side includes product planning, production control, and resource management. Dedicated subsystems belong to different organizations, each with its own user interface, data model, specialized operations, and storage organization.

In many business areas, it will be necessary for the companies in an IVE to exchange and cooperatively manage large amounts of data. It is unlikely that the information systems will be integrated with each other at the time a decision is made to collaborate on an offer or a bid. Even within one CIM company, many heterogeneous databases will exist. Yet sharing and exchanging data between the participating organizations and coordinating this information is critical.

In the following we present an example scenario of a CIM IVE. We then use examples from this scenario to illustrate areas where database functionality is needed for data that is not necessarily under the aegis of a DBMS.

Company A is building an oil pipeline and needs 600 large-diameter valves for the project. They solicit bids by issuing an RFP specifying dimensions, coupling mechanism, operating temperatures, pressure ranges, corrosion resistance, and so forth. Company Q, an engineering firm, wants to put together an IVE to respond to the RFP. Engineers at Company Q use the Internet to search for companies that already have a design for a similar valve that can be used. It turns out that Company R is willing to license such a design. Company Q plans to do the design modification work itself, but will contract with Company S to do an engineering analysis of the resulting design and convert the design to manufacturing plans. Company T is brought in to do the actual fabrication, but will contract out to Company U for die-making and casting. Finally, Company V and Company W will also cooperate: Company V provides a design file conversion service to be used for converting design files for the CAD package that Company R uses into the format for the CAD system that Company Q plans to use. Company W provides a documentation and archiving service for documents such as instruction and maintenance manuals.

We now give examples of the kinds of database capabilities needed here, both in putting together the bid and in fulfilling the contract (if awarded).

When Company Q looked for an existing design of a valve, they were executing a query. A number of aspects of this query are particularly challenging: parts of it are based on closest match rather than exact match; the query asks about designs from many companies that presumably reside in many different repositories; and the design from

Company R may be stored not in a DBMS but in individual files for which there might not be the analog of a database schema. Similarity search requires sophisticated indexing, based on many descriptors and high-dimensional feature vectors. This aspect is already challenging. Moreover, the interesting point here is that we must provide query and indexing support on external objects. Whatever sophisticated index support we invent must keep track of changes of external objects and keep the index consistent with them.

For Company S to estimate a cost for engineering analysis and manufacturing plans, it needs to see the original design, but in a form compatible with its tools. Thus, in putting together a bid, there is a need for data translation services such as those provided by Company V. However, Company V needs to know the format of Company R's design files. It is possible those files are in a self-descriptive data interchange format, but it is also possible that descriptive information will have to be added. Often standards such as STEP/EXPRESS are used for the description and for the exchange of CIM product data. However, additional mechanisms must be provided in order to let Company R restrict the information given out to a "need-to-know" subset of the schema: we can hardly imagine that Company R will give away all the details just for the purpose of putting together a bid.

If the bid is awarded to the IVE led by Company Q, there will be a need for coordination and configuration management, as the original design is initially modified to meet specifications and then further modified based on analysis by Company S and feedback on manufacturability by Company T and Company U. Various dependencies between data in the different IVE companies must be coordinated (i.e., coordination between objects in different subsystems). Relationships and (referential) integrity constraints must be modeled and maintained without requiring a traditional global database. Changes to an object in one subsystem require changes to one or more related objects in other subsystems. Changes in external systems need to be monitored and potentially propagated to other systems. For example, if Company U changes the spindle of the valve, the related documentation about the valve must be changed by Company W. Access to the spindle in Company U might be restricted until the documentation is updated by Company W. Again, only "need-to-know" information (i.e., information necessary to update the documentation) is exported by Company U.

Assume that Company Q decides to replace the spindle t provided by Company T by a spindle t′ of another company T′ because t′ is equivalent in some sense but cheaper. This change may cause changes in all valve type designs where t was used, resulting in a conflict between the marketing decision of Company Q and the design activities of Company S. Supporting actions to resolve such conflicts is critical to the IVE. For example, in this case, a decision must be made to determine whether all valve type designs must change to use t′ instead of t, or whether some valve designs might continue without change, making renegotiations necessary with T. Monitoring relevant changes and detecting conflicts is the DB functionality to be used here.

While the IVE operates, there is also a need for security and access control over the information. For example, it may be the case that Company R and Company T are competitors, so R is willing to let Q and S see the original design, but does not want T to have access.

Finally, Company A needs assurance that information on design and manufacturing of the valves is available even after the IVE disbands. Thus, there is a need to archive information that is possibly independent of any of the IVE companies. Such archiving is a database.

4.2 Personal Information Systems

A *personal information system* provides information tailored to an individual and delivered directly to that individual via a portable, personal information device (PID) such as a personal digital assistant, handheld PC, or a laptop. The PID can be either carried by the individual or mounted in an automobile, and will be equipped with a wireless network connection. It will also have network ports for "plugging in" when a stationary network connection is available.

A user equipped with a PID will, in the near future, have access to the Internet from anywhere at any time. However, the physical link will vary widely in terms of characteristics such as bandwidth (several kilobits/sec to several megabits/sec) and prevailing error rates. Tariffs and charging schemes for information will also vary widely; some providers may charge per packet while others may charge by connection time. In addition, the method of information delivery will cover a wide spectrum of possibilities from periodic broadcast (satellite networks, pointcast, etc.) to standard, request-driven, client-server scenarios. Also, global positioning systems will be widely available, and there is every reason to assume that in a few years every laptop will have a GPS card. Thus, location will become an important parameter in selecting information, especially for location-dependent information services.

We envision a personal information service as tightly integrated with an individual's activities from the time of waking up in the morning, through the person's daily activities, up to bedtime. These services would work on behalf of the person even while he or she is asleep.

In the morning, the services could include a local weather report, a list of reminders about special events of the day (such as birthdays or anniversaries of friends and relatives), a list of morning work meetings and appointments (e.g., dentist), and suggested diet for the day from a personal health advisor.

Delivery of personal information services will continue as the person commutes to work. The PID can provide the best route from home to work based on up-to-date traffic conditions, with expected delays displayed on a city map (the best route may include a combination of private as well as public transportation). It may provide personalized news headlines from national newspapers such as the New York Times and the Wall Street Journal as well as international headlines from papers such as The Globe and Mail; on Mondays, the report will include a summary of international weekend sporting events (e.g., Italian soccer league). It could provide a personalized investment report, with recommended investments for that day provided by a personal financial advisor. By the time the person arrives at work, he or she is completely up to date on the events and news of interest.

Personal information services will continue throughout the day. Upon arrival at the office, the services could deliver a list of tasks for the day, a list of customers to contact, a reminder to set up an appointment for a periodic dental examination, a summary of breaking news of interest, information about the start of a sale from a local furniture store on a particular piece of home furniture, and a notification about the best airplane ticket to purchase for an upcoming vacation. If the person drives anywhere during the day, the services will provide best driving routes, always based on up-to-date traffic information.

At the end of the day, the personal information service will provide a preview of the next day's activities and the person's daily diet balance statement from the personal health advisor, as well as appointments and activities for the next day.

The PID must continuously query remote databases and monitor broadcast information. Thus, personalized information systems will magnify today's cli-

ent-server performance, scalability, and reliability problems. Servers that both disseminate (push) information to clients and respond to (pull) client requests will play an important role in the delivery of personalized services. The load on these servers will potentially be much higher and the requests will likely be more sophisticated. Among the architectural problems that arise in an environment like this are questions of whether data should reside on the PID or on the server, and which tasks should be performed on the PID as opposed to the server.

5. BARRIERS

A DBMS provides a tightly controlled and highly uniform environment. All access to data passes through the upper levels of the system, making it relatively easy to control all occurrences of certain classes of event. For example, updates can be detected easily, thus making index maintenance manageable. The layout of data in files is known, the contents of data buffers is under strict control of the DBMS, and all stored data corresponds to an explicit schema.

Life becomes more complex when we try to provide database functionality outside of the confines of a DBMS. We are talking about moving to an environment in which there may be no central point of control and in which there may not be a great deal of uniformity. Thus, conventions and assumptions that held in a DBMS and could be exploited by its components now need to be negotiated. Similarly, uniformity either must be discovered post facto or new ways of providing functionality that can cope with variance must be devised.

In order to adequately address the vision in our scenarios, a number of technical barriers that typically result from new application requirements not yet addressed or from the need for new DBMS architectures must be removed. In this section we outline some of these barriers.

5.1 Overhead

A modern DBMS is a software engineering *tour de force*. It represents hundreds of person-years of effort and a very mature technology base. Managing a corporate information system without such a device would be folly. Creating a special-purpose DBMS is an unjustifiable investment.

However, many application builders are ignoring this industry because the modern database system is a heavyweight resource. The overhead in terms of system requirements, expertise, planning, data translation, and monetary cost is too great for many emerging applications. For example, a builder of a personalized newspaper service might choose not to use a DBMS because she or he has no need for many of the advanced features but is interested only in filtering stream-oriented data (as, for example, in the wire services).

A subset of the traditional database services is needed, though, by many new applications. An ideal world would offer a collection of database modules that one could mix and match to produce a configuration that is as lean or as full-featured as needed. For example, a wire service only needs a common data model and stream-based querying.

5.2 Scale

The database environments of interest to us require rethinking expectations concerning size. Some applications manage quite small databases for which the management overhead of a full DBMS is overkill. Indeed, in many instances the benefits of a DBMS are not used simply because the overhead of the DBMS is too large.

At the other end of the spectrum, the volume of data in future applications may be many orders of magnitude greater than what database applications routinely deal with today. If we are going to locate information on the Internet, we must be prepared, at least conceptually, to handle many petabytes of data growing at unpredictable rates.

The number of client and server sites is also many times greater than in any corporate network. In current client-server systems, there are typically a very small number of servers (often one) to supply data to a modest client population. In our scenarios, there could be a hundreds of thousands of servers and the client population could be even larger.

Distribution patterns in this new world are more geographically dispersed than anything we are used to. Information suppliers could be anywhere in the world. The unrestricted use of sites in distant places means that the cost of accessing an information source can depend on the available bandwidth into and out of those sites. This effective bandwidth can vary depending on the time of day and the popularity of the site.

Since all of these parameters create an optimization nightmare, it will become imperative to avoid large unrestricted searches of many sites. Instead, it must be possible to precompute much of the information and store it in a few more convenient places.

In the personal information system scenario, it is clear that servers will need to handle several orders of magnitude more requests than today's servers. Consider a personal information device in every car continuously requesting information from a server or servers geographically distributed in a city. Robust and scalable server designs will be needed in which the volume of requests handled increases with the amount of server resources available.

Occasionally, servers will become hot spots, such as the 911 emergency service or a server close to a football or baseball stadium (overloaded when there is a game). In such cases, broadcast rather than point-to-point communication may be an alternative in satisfying commonly expected requests thereby reducing the workload on the server. Understanding when to broadcast, how to organize a broadcast, and how best to use local client memories become important issues.

5.3 Schema Organization

The standard database paradigm involves first creating a schema to describe the structure of the database and then populating that database through the interface provided by the schema. The DBMS maps the input data to actual storage structures.

Increasingly, we will no longer have the luxury of an a priori schema. Many applications currently create data independently of a database system[2] (e.g., scientific applications), and as information gets easier to collect, transmit, and store, this mismatch will only get worse. Thus, there is a need to map externally generated data to a schema (and possibly to new storage structures) after the fact. This bottom-up approach to populating databases is not often supported in current systems. It is crucial, however, to provide simple mechanisms for making foreign data sources available to database systems in order to realize something like the IVE scenario. Such a facility involves complex mapping procedures. We are talking about creating what is, in effect, a database view of the foreign data, but the view must be constructed over data in arbitrary formats.

The data that is received from a source like a Web site may appear to have some structure. Pieces of text are coded with tags describing their role. Unfortunately, the use of these tags may be quite varied. The fact that one page uses an *H3* tag for headings does not necessarily carry across to other pages, perhaps even from the same site. This variation in the use of text coding makes it difficult to construct something we normally think of as a schema to describe things like web pages.

Moreover, as new data is added to these data sources, we may find that a

[2] This is a major reason why a large fraction of these applications do not use database systems today.

schema is incomplete or inconsistent. Thus, the current rigidity of database schemas becomes an impediment to using database systems to address the needs of many information systems. We need schema management facilities that can adapt gracefully to the dynamic nature of foreign data. Moreover, the schema must allow different formats and different sets of properties for the data as it appears in the DBMS.

5.4 Data Quality

Information accessed from a wide-area network may be of varying quality. Quality relates to the timeliness, completeness, and consistency of the data. Future information systems must be able to assess and react to the quality of the data source. Often the source of the data will give clues regarding data quality. Quality-related metadata must be captured and processed in a way that is as transparent as possible to the user.

Current database technology provides little support for maintaining or assessing data consistency. Constraint maintenance in commercial systems is limited to a few simple constraint types such as the uniqueness of keys and referential integrity. Even if there were a way to include a quality metric with data values, there is no way in current systems to include it in processing the data from disparate sources. For example, we might not want to have two values participate in a join if their quality metrics are significantly different.

5.5 Heterogeneity

The database community has long recognized that data exists in many forms. Dissimilar formats must be integrated to allow applications to access combined data sources in a high-level and uniform way. The autonomy of information sites makes it impossible for any centralized authority to mandate standardization.

Imagine an archive of newspaper stories that covers the last 20 years. The archive also contains descriptive information about when and where the stories appeared, the source of the articles, the author, and other related articles. It would be very difficult to provide a single interface to all of this information because of its *semistructured* nature. Semistructured means that the structure of the data is less uniform than what we might find in a conventional DBMS (e.g., files may routinely be missing or have varying semantics).

While there has been a great deal of research in integrating data and operations from heterogeneous sources, products are only just beginning to emerge. Distributed object management as manifested in products such as CORBA, SOM, and OLE seems to be the dominant approach. Each of these provides an object-oriented model as the common language for describing distributed object interfaces. While these standards, and the systems that support them, go a long way towards integrating different software systems, they are best suited for providing uniform syntactic interfaces to new or existing applications. They provide a common protocol for passing messages between objects in a distributed environment, but do not tackle the difficult problem of resolving semantic discrepancies. They cannot be used directly to integrate or create uniformity of data from different sources. In general, sophisticated tools for dealing with data heterogeneity still need to be layered above CORBA, SOM, or OLE interfaces.

5.6 Query Complexity

In future environments, query optimization takes on some very different characteristics, making conventional optimizers inadequate. First, the types that must be considered include diverse bulk types such as sequences, trees, and multidimensional arrays. Second, other types that are stored will be highly application-specific; they will be instances of arbitrary abstract data types.

Conventional query optimization tries to minimize the number of disk ac-

cesses. Network optimization might be based on quite different criteria. For example, a user might be more interested in getting an answer in a way that minimizes the total "information bill" for that request. Given two sources that can handle a request, the optimizer should pick the one that will result in a lower charge. This charge can include cost components from processing, data usage, and communication.

Also, optimizers will need to employ different strategies to account for the new forms of data and the characteristics of new computing environments. Standard query optimization techniques have little to offer for a query over a large time series or for a query that may have to translate several data sets into a canonical form before producing a result. Situations like these are very likely to arise in the IVE scenario.

If we consider the personal information systems scenario, for example, we see a need for more flexible query optimization techniques that will consider changes in the cost of available broadcast medium (e.g., radio, cellular) as the PID moves. The degree of detail or accuracy provided by the server may be based on the amount of money the person is willing to pay. Thus, query optimization models must take into account not only the formulation of the requests but also a description of optimization goals. These goals might be couched in terms of resource consumption (e.g., optimize for minimum memory consumption and maximum network use) or as execution limits based on accuracy of answer or allowable resource consumption.

5.7 Ease of Use

Even though there has been tremendous improvement in ease of installation, management, and use of DBMSs, especially those that run on personal computers or workstations, many applications still prefer to use a file system rather than a DBMS. There is an implicit assumption that a DBMS will be managed by a highly trained, full-time staff, yet most database users have no training in database technologies. Users still find it difficult to connect to a DBMS, to find the right catalog or database name space where data is stored, and to formulate queries and updates to the database.

The file system connection and access paradigm are easier to understand, and database systems that are easier to use would present an opportunity for their more pervasive use.

If a complex and time-critical application, like the one presented in the IVE scenario, required a complex programming activity, it would never be workable. Instead, a simple set of interfaces is required to allow managers of the IVE to specify high-level requirements on things like the design of the needed valve. The mapping and matching of data from many distributed sources needed to locate relevant designs must all occur transparently.

A database systems would be easier to use, for example, if it were to adapt to individual user interests. For a personal information system, there could be a way for the server to handle different personal profiles. The personal profiles could include travel itineraries within a city at various times of the day, week, or month (e.g., home to work in the morning and evening, visiting client A on Wednesday, etc.), bank branch locations, cash machine locations, favorite restaurants, or movie theaters. The server could send the PID time-varying information that is relevant to the user profile, and this information could be displayed on a map of the city. This makes a view of the database available to users in a form that is easy to apply to managing their schedules.

5.8 Security

The World Wide Web (WWW) supports quick and efficient access to a large number of distributed, interconnected information sources. As the amount of shared information grows, the need to

restrict access to specific users or for specific use arises. The non-uniformity of WWW documents, and the physical distribution of related information, make such protection difficult.

Authorization models developed for relational or object-oriented database management systems cannot be adapted to securing hypertext documents for a number of reasons. First, in defining a suitable authorization model, the semantics of the data elements must be clearly defined and the possible actions that can be executed on them must be identified. The definition and semantics of the conceptual elements of a hypertext document are not uniform and vary from system to system. A second difficulty derives from the fact that the "data elements" of a hypertext document are not systematically structured, as is the data in a database management system. As noted earlier (Section 5.3), there is no equivalent of the "database schema," making it more difficult to administer authorizations. Third, an authorization model for hypertext needs to support different levels of granularity for both performance and user convenience. For example, it should be possible to assign authorizations not only for a single hypertext node, but also for a part of a node, without being forced to break the node unnaturally into multiple pieces.

5.9 Guaranteeing Acceptable Outcomes

Transaction management provides guarantees that user activities will leave the database in an acceptable state. Committed transactions take a database from one acceptable state to another. Otherwise, an aborted transaction is guaranteed to leave the database in its pretransaction state. Only acceptable states are made visible to concurrent users.

Transaction management is an extremely successful field with a well understood and sound theory and sophisticated techniques for high-performance implementations. Its success is documented by the impressive transaction rates in existing database products.

Despite its success, transaction management can become a barrier to both system performance and the ability to specify acceptable outcomes. Today's transactions link together atomicity, isolation, and persistence; this linkage imposes both performance overhead and rigidity in what it requires of transaction outcomes. Moreover, transaction management is currently database-centric; that is, most transactional data is "in the box."

New applications and system environments require new or enhanced transaction technology. Long-running applications need to define acceptable outcomes that are weaker than serializability because making data unavailable (isolation) for long periods of time is unacceptable. Further, aborting entire transactions in the face of potentially unacceptable outcomes is draconian. We need to avoid losing useful work and free the end user from dealing with unsuccessful transaction outcomes, e.g., those requiring resubmission.

Today, wide-area networks, of which the Internet is the prime example, are making it possible for widely separated individuals and organizations to do business. However, today's standard protocol for distributed transaction processing (two-phase commit) imposes a barrier to the participation of component systems because it is a blocking protocol that compromises the autonomy of the participants. Thus, posing an even larger problem when the component systems are only intermittently connected or are of highly variable reliability and trustworthiness. For these reasons, today's transaction management facilities are often considered inappropriate for modern distributed applications such as those discussed in Section 4.

5.10 Technology Transfer

In addition to the specific barriers listed above, there is also a barrier between

research and industry. There is insufficient knowledge by researchers of the techniques and solutions needed by industry, and insufficient utilization of the results of research by industry. The monolithic structure of a DBMS contributes to the problem. Each improvement has an impact on many portions of the code base, rendering vendors hesitant to apply insights generated by the academic community. Researchers generally have little understanding of these complex interactions. Finally, much of the database technology available commercially is dictated by standards that have had little input from the research community.

6. RESEARCH

In order to achieve our vision and overcome barriers, a number of central research topics must be addressed. We enumerate the most prominent of these:

Extensibility and componentization. While this report has argued that database components be used for lightweight support of new applications, there is also a related need to approach the construction of DBMS in a modular way. We are beginning to see the emergence of lighter-weight database engines from some vendors that begin to address this concern. Even in applications that need the full functionality of a database management system, there is often a need to extend that functionality with application-specific support.

Even though extensible DBMSs today allow the definition of new data types (ADTs) or provide native support for new types such as text, spatial data, audio, and video, these extensions and services are available in closed, proprietary ways. We need to create systems that make it easier for developers to incorporate new data types, developed outside the DBMS, that can be manipulated inside a database as first-class native types. Similarly, we need to look for ways to open the architecture of DBMSs in such a way that new services can be incorporated and that database functionality can be configured in more flexible ways according to application needs.

Research is also required to find ways for DBMS components to cooperate or be integrated with non-DBMS components such as operating systems, programming languages, and network infrastructures. For example, query processing and data movement components should be able to take advantage of, and cooperate with, advanced network facilities in order to negotiate quality-of-service and bandwidth allocation.

Imprecise results. In today's DBMSs, we expect 100% accurate results; that is, we assume that there is a single correct and complete answer to a query. In the Web or other large information sources, this level of accuracy may not be possible or desirable. In fact, many search engines for text and multimedia types do not provide 100% accuracy. Research has been done on similarity queries, but in general these results are isolated and are based on peculiarities of specific data types (e.g., images, text). There is nothing to tie the type-specific techniques together; we need to develop a general theory of imprecision.

Schemaless database. In order to apply database facilities to data created outside of a DBMS, we will need sophisticated data mapping facilities. Ideally, these mapping tools would be declarative, and thus combinable with a query language, as is done in SQL.

When the structure of data is dynamically evolving, it is difficult to capture it with a fixed schema. The Web is a good example of such data. Nevertheless, extensions to existing database techniques can be used to query and transform this kind of unstructured data.

Ease of use. Better database interfaces are required if we are to get the kind

of penetration into personal computing that other tools like spreadsheets and word processors have had. We cannot expect users to write SQL. Similarly, it is important to translate theoretical notions to usable techniques. For example, *functional dependencies* were developed in relational database theory. They underlie many of the PC DBMS design aids without users needing to be expert in the theory.

New transaction models. New transaction models permit user-defined notions of correctness and allow transactions to be nested. Often they decouple atomicity from isolation. They typically allow notions like semantic serializability and semantic atomicity. The models make it possible to specify compensation/rollback that is local to a scope. We need to design mechanisms for these models to support partial rollbacks followed by an ability to go forward to an acceptable state that not only leaves the database consistent but also accomplishes useful work for the end user.

New transaction models also try to overcome blocking in the 2PC protocol in that they allow more autonomy by early commits at the cost of potential compensation. We need to investigate requirements on the properties of a subsystem in order to include it in such a distributed transaction. We also need to study the scheduling and correctness requirements that can be taken "outside the box."

Query optimization. Query processing will have to be extended to cover more data types than those handled in today's database products. For example, queries involving sequences (e.g., time series) are becoming more important. Optimization over these structures will require new indexing methods and new query processing strategies.

Also, optimization criteria may change. In the past, optimizers tried to reduce overall response time by reducing the total resource consumption (possibly dominated by the number of disk accesses) required to process the query. Users may wish to minimize their overall information bill by using sources that are cheaper but may give slower response time. Alternatively, a user may care more about accuracy and completeness than cost, thus requiring that the optimizer find the most reliable and up-to-date sources.

In addition, in nomadic or wireless computing, query optimization must be sensitive to band width and power considerations. Satellite broadcast might be required in order to achieve the necessary bandwidth to deliver large amounts of data in a mobile environment. In addition, query processing algorithms must be sensitive to battery consumption issues on the mobile computer.

Data movement. In a highly distributed environment, the cost of moving data can be extremely high. Thus, the optimal use of the communication lines and caches on various intermediate nodes becomes an important performance issue. While these considerations are related to distributed query optimization, we must consider overall system access patterns as opposed to the processing of a single request. We must also consider existence of asymmetric communication channels introduced by low-bandwidth lines and/or highly loaded servers.

Security. Issues related to access control in distributed hypertext systems include (1) formulation of an authorization model; (2) extension of the model to take distribution aspects into consideration; (3) interoperability between different security policies; and (4) investigation of credential-based access control policies.

Database mining. Database mining is another rapidly growing research

area that can also be thought of as "out of the box." It is a synergy of machine learning, statistical analysis, and database technologies. Discovery tasks such as rule (association) generation, classification, and clustering can be viewed as ad hoc queries leading to new families of query languages. Evaluation of such queries require running inductive machine-learning algorithms on large databases. Research challenges include the design of an adequate set of simple query primitives and a new generation of query optimization techniques.

Solutions in some of the above areas will also have the positive effect of making possible the transfer of newer technologies. For example, extensibility will permit novel, as yet undeveloped indexing approaches to be incorporated into a database system, without affecting the other components of the existing DBMS. Moreover, the research community needs to participate more fully in standardization efforts and to form a closer partnership with industry.

7. CONCLUSIONS

In this report we argued that database research must be more broadly defined than in the past. We discussed the idea that the database community must apply its experience and expertise to new problem areas that will likely require new solutions packaged in ways that may not resemble existing database systems.

The long-term view is that the database community can contribute a great deal to the very general problem of scalable, efficient, and reliable information systems. Information must be defined in the broadest of terms to include a large variety of semantic types that are obtained in many forms. The vision is an integration that supports the application of database functionality in small modules that give us just the right capability. These modules should also represent a unified theory of information that allows for the querying information of all types, without having to switch languages or paradigms.

ACKNOWLEDGMENTS

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Database Security and Privacy

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A complete solution to either the security or the privacy problem requires the following three steps:

—*Policy*. The first step is to develop a security or privacy policy. The policy precisely defines the requirements that are to be implemented within the hardware and software of the computing system and those that are external to the computing system, including physical, personnel, and procedural controls. The policy lays down broad goals without specifying how to achieve them.

—*Mechanism*. The security or privacy policy is made more concrete with the mechanism necessary to implement the requirements of the policy. It is important that the mechanism perform the intended functions.

—*Assurance*. The last step deals with the assurance issue. It provides guidelines for ensuring that the mechanism meets the policy requirements with a high degree of assurance. Assurance is directly related to the effort required to subvert the mechanism. Low-assurance mechanisms are easy to implement, but also relatively easy to subvert; on the other hand, high-assurance mechanisms are notoriously difficult to implement.

The high-level objectives of security are well known: (1) *Secrecy (or confidentiality)*, which is concerned with unauthorized disclosure of information; (2) *integrity*, which is concerned with unauthorized modification of information or processes; and (3) *availability*, which is concerned with improper denial of access to information.

Less well known are the basic principles for achieving information privacy. They are as follows:

(1) *Proper acquisition and retention* is concerned with what information is collected and how long it is retained by an organization.

(2) *Integrity* is concerned with maintaining information on individuals that is correct, complete, and timely. The source of the information should be clearly stated, especially when the information is based on indirect sources.

(3) *Aggregation and derivation of data* is concerned with ensuring that any aggregation or derivations performed by an organization on its information are necessary to carry out its responsibilities. Aggregation is the combining of information from various sources. Derivation goes one step further; it uses different pieces of data to deduce or create new or previously unavailable information from the aggregates.

(4) *Information sharing* is concerned with authorized or proper disclosure of information to outside organizations or individuals. Information should be disclosed only when specifically authorized and solely for the limited use specified.

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(5) *Proper access* is concerned with limiting access to information and resources to authorized individuals who have a demonstrable need to perform official duties. Thus, information should not be disclosed to those who are either not authorized or do not have a need to know (even if they are authorized).

Privacy protection is a fundamental personal right of all individuals. Individuals have a right to expect that organizations will keep personal information confidential. One way to ensure this is to require that organizations collect, maintain, use, and disseminate identifiable personal information and data only as necessary to carry out their functions. In the U.S., the federal privacy policy is guided by two key legislations: The Freedom of Information Act of 1966 and The Privacy Act of 1974.

RESEARCH DIRECTIONS

Current research efforts in the database security area can be classified in three main ways (see Bertino et al. [1995] for a detailed discussion and relevant citations):

Discretionary Access Controls. The first direction concerns discretionary access control in relational database management systems (DBMSs). Recent research efforts attempt to extend the capabilities of current authorization models so that a wide variety of application authorization policies can be directly supported. Related to these extensions is the development of appropriate tools and mechanisms to support those models. Examples of these extensions are models that permit negative authorizations, role-based and task-based authorization models, and temporal authorization models.

Mandatory Access Controls. The second research direction deals with extending the relational model to incorporate mandatory access controls. Several results have been reported for relational DBMSs, some of which have been applied to commercial products.

Authorization for Advanced DBMSs. The third direction concerns the development of adequate authorization models for advanced DBMSs, like object-oriented DBMSs or active DBMSs. These DBMSs are characterized by data models that are richer than the relational model. Advanced data models often include notions such as inheritance hierarchies, composite objects, versions, and methods. Therefore, authorization models developed for relational DBMSs must be properly extended to deal with the additional modeling concepts. Some of those problems have been addressed by recent research. However, work in the area of authorization models for object-oriented databases is still at a preliminary stage. Of the object-oriented DBMSs, only Orion and Iris provide authorization models comparable to those provided by current relational DBMSs.

The research above, however, constitutes only a small aspect of overall security. As an increasing number of organizations become dependent on access to their data over the Internet, the network aspect of security is also critical. There are several new and open research issues that involve access controls to information over the Internet.

Information servers such as the World-Wide Web support quick and efficient access to a large number of distributed but interlinked information sources. As the amount of information to be shared grows, the need to restrict access to specific users or for specific usage will surely arise. The protection of information, however, is difficult because of the peculiarity of the hypertext paradigm that is generally used to represent the information, together with the fact that related objects in a hypertext are often distributed at different sites. Very few hypertext systems provide any form of protection, and the ones that do enforce a very primitive form of authorization specification and control. There are several issues related to access control in distributed hypertext systems, including (1) formulation of an authorization model for a hyper-

text system, (2) extension of the model to take distribution aspects into consideration, (3) investigation of different policies for the administration of authorizations, and (4) investigation of credential-based access control policies.

CONCLUDING REMARKS

The most popular security measure these days is a *firewall* [Cheswick and Bellovin 1994]. A firewall sits between an organization's internal network and the Internet and monitors all traffic from outside to inside, blocking any traffic that is unauthorized. Although firewalls can go a long way toward protecting organizations against the threat of intrusion from the Internet, they should be viewed only as the first line of defense. Firewalls are not immune to penetration; once an outsider is successful in penetrating a system, firewalls typically provide no protection for internal resources. Moreover, firewalls do not protect against security violations from insiders, an organization's authorized users. Most security experts believe that insiders are responsible for a vast majority of computer crimes.

For general references on computer security, see Abrams et al. [1995], Amoroso [1994], and Denning [1982]. Texts by Castano et al. [1994] and Kaufman et al. [1995] are specific to database and network security, respectively. Security in statistical databases is covered in Denning [1982] and in the survey by Adam and Wortman [1989].

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Managing Security and Privacy of Information

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With rapid advancements in computer and network technology, an organization can collect, store, and retrieve vast amounts of data of all kinds quickly and efficiently. Databases of today no longer contain only data used for day-to-day data processing; they have become information systems that store everything, vital to an organization or not. Information is of strategic and operational importance to any organization; if the concerns related to security are not properly resolved, security violations may lead to losses of information that may translate into financial losses or losses whose values are obviously high but difficult to quantify (e.g., national security). At the same time, these large information systems represent a threat to the privacy of individuals since they contain a great amount of detail about them. Admittedly, information collection by an organization is essential for conducting its business; however, indiscriminate collection and retention of data represents an extraordinary intrusion on privacy of individuals.

Privacy protection is both a personal and fundamental right of all individuals. Individuals have a right to expect that organizations will keep personal information confidential. One way to ensure this is to require that organizations collect, maintain, use, and disseminate identifiable personal information and data only as necessary to carry out their functions. In the U.S., federal privacy policy is guided by two key pieces of legislation: the Freedom of Information Act of 1966 and the Privacy Act of 1974.

The high-level objectives of security are well known: (1) Secrecy (or confidentiality), which is concerned with unauthorized disclosure of information, (2) Integrity, which is concerned with unauthorized modification of information or processes, and (3) Availability, which is concerned with improper denial of access to information.

Less well known are the basic principles for achieving information privacy. They are are follows: (1) Proper acquisition and retention is concerned with what information is collected and, after collection, how long it is retained by an organization. (2) Integrity is concerned with maintaining information on individuals that is correct, complete, and timely. The source of the information should be clearly stated, especially when the information is based on indirect sources. (3) Aggregation and derivation of data is concerned with ensuring that any aggregation or derivations performed by an organization on its information are necessary to carry out its responsibilities. Aggregation is the combining of information from various sources. Derivation goes one step further; it uses different pieces of data to

deduce or create new or previously unavailable information from the aggregates. (4) Information sharing is concerned with authorized or proper disclosure of information to outside organizations or individuals. Information should be disclosed only when authorized specifically and solely for the limited use specified. (5) Proper access is concerned with limiting access to information and resources to authorized individuals who have a demonstrable need to perform official duties. Thus, information should not disclosed to those that either are not authorized or do not have a need to know (even if they are authorized).

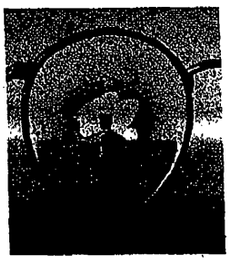
Information servers such as the World Wide Web support quick and efficient access to a large number of distributed but interlinked information sources. As the amount of information to be shared grows, the need to restrict access only to specific users or for specific usage will surely arise. The protection of information, however, is difficult because of the peculiarity of the hypertext paradigm which is generally used to represent the information, together with the fact that related objects in a hypertext are often distributed at different sites. Very few hypertext systems provide some form of protection, and the ones that do so enforce a very primitive form of authorization specification and control. There are several issues related to access control in distributed hypertext systems, including (1) formulation of an authorization model for a hypertext system, (2) extension of the model to take distribution aspects into consideration, (3) investigation of different policies for the administration of authorizations, and (4) investigation of credential-based access control policies.

Today's Style Sheet Standards: The Great Vision Blinded

Philip M. Marden, Jr., and Ethan V. Munson

Many articles, like Nate Zelnick's Standards column ("Nifty Technology and Nonconformance: The Web in Crisis," *Computer*, Oct. 1998, pp. 115-116, 119), attribute the Web's continuing development crisis to the failure of commercial browsers to fully implement agreed-upon standards. This is an important issue: Nonconformant and incomplete implementations have been a nightmare for Web developers. However, there is a deeper issue—one that has had little public discussion: Will these standards actually provide the envisioned benefits for the Web?

Style sheets, which specify how documents are presented to users, are expected to play a critical role in the Web's architecture. Through the use of style sheets, future Web documents will be easier to author and will be accessible everywhere, from PCs to TVs to palm devices to cellular phones. Unfortunately, the current standards appear to impede this grand vision of the Web.



Style sheets are a critical part of the grand vision for an improved Web.

THE VISION

Visionaries foresee a Web in which pages have rich semantics that enhance users' understanding and also facilitate searching with automated tools. In this grand vision, a huge variety of devices can view these semantically dense pages in innumerable styles tuned to users' diverse tastes, needs, and interests. This improved Web will offer total accessibility, with users listening to Web pages through aural browsers that speak or feeling them through Braille devices.

Style sheets are a critical part of this vision. The Extensible Markup Language (XML), which is expected to replace HTML, allows Web documents to contain much richer semantic information than is possible with HTML. However, unlike HTML, XML doesn't specify anything about a document's appearance. Browsers get this missing information from style sheets, which are separate appearance specifications. Because the style sheets are separate, it should be possible to mix and match them with documents to provide a variety of display and playback styles. An author only has to create a single version of a page, and users can apply appropriate style sheets to adapt the page to their devices and needs.

This vision of Web accessibility imposes a number of requirements. First, style sheet languages and systems must support the complete separation of content (XML) and presentation (style sheets) so that it isn't necessary to change content to suit the presentation's needs. Second, users must have final say over how style sheets are applied because they know their own needs best. This implies that final control over the style sheets will reside on the client side. Third, to have control over presentation, end users must be able to write at least the more simple style sheets themselves. This means that the languages must be relatively easy to use, but they must also have sufficient expressive power to support a wide range of complex presentations.

STYLE SHEET STANDARDS

W3C has two style sheet standards: Cascading Style Sheets (CSS) for HTML and the Extensible Style Language (XSL) for XML. Although CSS's architecture appears to be well suited to the Web, its language contains flaws that would hinder good engineering practices even if it were fully supported by browsers. However, XSL, the Web's next-generation style sheet standard, appears to contain even more significant flaws.

Cascading Style Sheets

On the positive side, CSS provides moderately good support for authors and end users to specify how Web documents are presented on a variety of devices, including aural browsers. CSS's overall architecture satisfies the requirement of giving users final say over how style sheets are applied: CSS defines how to cascade or combine style sheets supplied by users and clients with style sheets from authors. In addition, CSS provides easy access to common style solutions for HTML.

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Simple style sheets are almost trivially easy to write. For example, `P { font-size : 12pt; }` is a complete style sheet specifying that paragraphs (P elements) should use a 12-point font. So, like HTML, CSS has a gradual learning curve.

On the negative side, CSS's language has some flaws: Its semantics are inconsistent, and it has limited expressive power. In CSS, the property rules have the form `<property> : <value>`. The set of acceptable values varies substantially from property to property. Furthermore, a value's interpretation can also vary from property to property. For example, `font-size:80%` means 80 percent of the parent element's font size, while `line-height:80%` means 80 percent of the same element's font size. Even though the semantics for each property are generally quite intuitive, as properties are added to CSS, we believe its users will be overwhelmed by special cases, and it will be harder to understand the language.

Unfortunately, CSS doesn't allow its users to specify values via arbitrary mathematical expressions. As a result, style sheet authors can express only those cases that CSS's designers have recognized as valuable. For example, there is no way to set an element's font size to 80 percent of the root element's font size, which might be expressed as `font-size : root.font-size * 80%`. CSS's lack of expression support is particularly crippling for layout, where mathematical expressions are a powerful tool for positioning elements relative to one another. Other limitations on CSS's expressive power include restrictions on contextual selectors and the fact that generated material does not support the full range of style properties.

These limits on expressive power restrict the styles authors can create, and they also hinder the separation of presentation and content. When a style effect can't be described in a general way, Web developers inevitably embed style information in the source document that contains the content, using ID tags or presentational tags to get the desired effects. These tricks still require using a style sheet, but the developers use style sheets specialized for a single document, rather than sharing a style among many documents. Thus, they lose one of the most important engineering benefits of style sheets.

Extensible Style Language

We are skeptical that XSL can fulfill its envisioned role as XML's style sheet companion. XSL is a much larger language than CSS, and it defines a formatting vocabulary within the larger framework of a transformation language. Most XSL standardization efforts have focused on its transformation language. On the positive side, XSL supports separation of presentation and content, and it has considerable expressive power, including the ability to handle arbitrary mathematical expressions.

Client-supplied style sheets are critical to the goal of making the Web accessible.

Unlike CSS's architecture, XSL's architecture doesn't allow end users or their clients to supply style sheets to control document presentation. While the specification doesn't explicitly preclude user-provided style sheets, it also doesn't directly address the issue. This issue's importance can't be overemphasized: Client-supplied style sheets are critical to the goal of making the Web accessible from any device by any user. Without client-supplied style sheets, users have to depend on Web sites to support their devices and special needs. We doubt that large numbers of Webmasters would choose to publish versions for low-usage clients like aural and Braille devices, and we are certain that they can't anticipate every new browsing device's characteristics.

XSL is directly derived from the strongly page-based Document Style Semantics and Specification Language (DSSSL) for SGML documents, and XSL has inherited DSSSL's page-oriented formatting model. In fact, in XSL's current draft, even aural presentations are required to contain a sequence of pages. But why would an aural presentation have pages? Aural presentation has different needs than print presentation, and it demands a more flexible formatting approach. Thus, XSL's page-oriented approach limits its suitability for the full range of anticipated browsing devices.

While there is considerable debate about what makes a language "easy to use," we find using XSL difficult. First, because it uses XML syntax, XSL is expressed through markup tags, such as `<xsl:apply-templates/>` and `<fo:simple-page-master>`. This is an unusual, and possibly inappropriate, use of the markup paradigm because markup is typically used to annotate data with metadata, but XSL style sheets are almost entirely metadata (style and transformation instructions). Furthermore, this tag-based syntax means that XSL is verbose.

A second difficulty with XSL derives from its declarative transformation language. Document transformations arrange the material in a document in the order that it will be laid out on the page or screen. XSL advocates believe that its declarative approach is fundamentally easier to use than the imperative approach of scripting or programming languages. We disagree. Declarative languages are only easy to use when the user doesn't need to understand the language's underlying processing model. But, to write an XSL style sheet effectively, you need to understand processing models for both tree transformation and formatting.

Finally, XSL has a steep learning curve. Unlike CSS, simple XSL style sheets require substantial amounts of code. CSS avoids this problem through a combination of browser-defined defaults and its cascading mechanism.

UNEXPLORED TERRAIN

Style sheet languages are terribly underresearched. Only a few style sheet languages have been designed and implemented, and there is little accepted wisdom about the requirements for style sheet systems. The lack of solutions makes it difficult to make informed choices about the most appropriate style sheet language for the Web's grand vision.

In CSS's case, this lack of research has been less damaging because the CSS com-

To Learn More

- http://www.w3.org/Style: General information from the W3C on style sheets and style sheet languages.
- http://www.cs.uwm.edu/~multimedia: A description of the Proteus library and information about the PSL style sheet language.
- http://www.inrialpes.fr/opera/Thot: Information on the Thot structured document toolkit and the Thot language manual containing the P language.
- http://www.cs.washington.edu/research/constraints/web/: Papers describing Constraint Cascading Style Sheets.
- J. Bosak, "Media-Independent Publishing: Four Myths about XML," *Computer*, Oct. 1998, pp. 120-122.

mittee had a well-understood goal of improved style control for HTML, and they started with the style services used in everyday word-processing applications. The lack of prior research has been a much greater problem in the search for XML style solutions. XSL's development has been heavily based on DSSSL. At first glance, this seems logical since DSSSL is the ISO style sheet companion for SGML, and XML is derived from SGML. But DSSSL and XSL have a far narrower vision. They primarily address the needs of high-volume producers of print documents, such as government agencies. The Web's end users have very different needs.

Our research into style sheet systems and languages (Proteus and PSL) shows that there are alternatives to CSS and XSL that more closely meet the above criteria. The PSL style language has a syntax especially designed for the style sheet task and has traditional computational features including mathematical expressions and conditionals. In contrast to XSL, PSL does not emphasize transformations, and it uses constraints, rather than flow, to specify layout. Furthermore, there are other style languages, such as the Thot structured document toolkit's P language and the more recent Constraint CSS.

While we realize that substantial resources have been invested in CSS and XSL, we nevertheless urge the Web community to more fully explore alternate approaches to style sheets. ❖

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For: **"APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA"**	)	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

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February 11, 2000

Sir:

Submitted herewith on form PTO 1449 is a listing of documents known to applicants and/or their attorneys in compliance with the requirements of 37 C.F.R. § 1.56. Copies of these documents are enclosed.

Consideration of the cited documents and making the same of record in the prosecution of the above-noted application are respectfully requested.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as regular mail addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on the date indicated below.

Gregory J. Kirsch — Date: 11 FEB 2000

#7

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LIST OF PRIOR ART CITED BY APPLICANT
(Use several sheets if necessary)

ATTORNEY DOCKET NO.: 22022.0003	SERIAL NO. 09/428,511
APPLICANT: Freishtat et al.	
FILING DATE: October 27, 1999	GROUP: ~~2755~~ 2154

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
IAC	AA	5,897,622	04/27/99	Blinn et al.	705	26	Oct. 16, 1996
IAC	AB	5,848,396	12/08/98	Gerace	705	10	Apr. 26, 1996

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

IAC	AC	"Collapsible User Interfaces for Information Retrieval Agents," Martin Frank and Pedro Szekely, Proceedings of International Conference on Intelligent User Interfaces, January 5-8, 1999, Redondo, CA, pp. 15-22.
IAC	AD	"A Softbot-based Interface to the Internet," Oren Etzioni and Daniel Weld, Communications of the ACM, Vol. 37, No. 7, July, 1994, pp. 72-76.

EXAMINER: Kenneth Coulter DATE CONSIDERED: 8/27/2002

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Collapsible User Interfaces for Information Retrieval Agents

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ABSTRACT

This paper presents an architecture for information retrieval agents in which each agent declaratively describes its domain, input, output, and user interface. A mediating piece of software can then assemble software agents for a given information retrieval task, and produce a single, unified user interface for that task from the individual agents' descriptions.

Keywords

Software agents, information retrieval, model-based user interfaces, graphical user interfaces, human-computer interaction

INTRODUCTION & MOTIVATION

The World-Wide Web now gives us ready access to many real-time price quotes. At the same time, many prices have become more volatile. For example, the price of an airline flight can change many times a day, and airlines increasingly demand immediate payment to secure a price quote rather than guaranteeing a reservation for several days. Given the above, the best strategy for buying an airline ticket is to constantly watch the fare for the particular date that you are interested in, using the Web site of the airline or of a travel agency (or ideally both), and to be ready to immediately purchase the ticket if the fare drops.

Manual tracking would quickly become tedious. At the same time, supplier-side notification services ("give us your email address and we'll keep you posted") are not always available, often don't let you specify precisely what you are interested in, and can't generally be trusted to act in the best interest of the consumer. For those reasons, automated tracking presents a prime opportunity for software agents. In the airline domain, what one would want is automatic charting of past prices (so that one has an idea of what a "good price" is) as well as a notification when the price changes (so that one can react immediately).

IUI 99 Redondo Beach CA USA

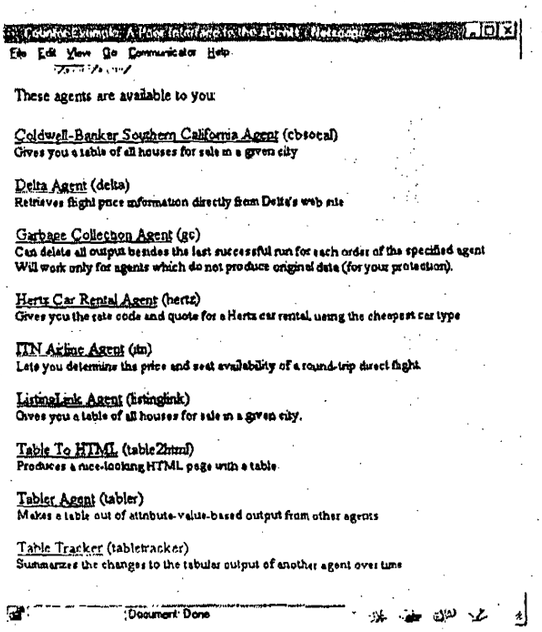


Figure 1: How the agents should *not* appear to the user

One possible approach to building such a system is to construct a monolithic application specialized for the airline domain. However, that would preclude easily re-using common components such as data tabulation and presentation for similar domains (say car rental reservations or real estate market tracking), and it would not let one plug in new capabilities on the fly (such as adding a new data source or a new graphing capability).

We have therefore taken a different approach in which several software agents work together in retrieving data from several sources, tabling it, and producing Web pages for the end user. Each declaratively describes its input, output, and parameter requirements. A mediating piece of software called the Scheduler then chains the agents together in a way that "makes sense", and collapses (blends, folds) their user interfaces into one. The prime design goal was that the agents should appear as individual entities from a software engineering perspective (maintainability, scalability) yet appear as a unified system from a user

interface perspective (usability).

Figure 1 shows an example of what we did *not* want the user interface to multiple agents to look like – the agents appear as separate entities that are given instructions independently. (The snapshot is adapted from an early version of our system that we built to exercise and debug the individual agents.)

WALK-THROUGH: TRACKING REAL ESTATE

This section describes the use of the Agent Playground from an end-user perspective. Imagine that you are about to buy a home in the Los Angeles area and want to keep track of home prices in neighborhoods you are interested in.

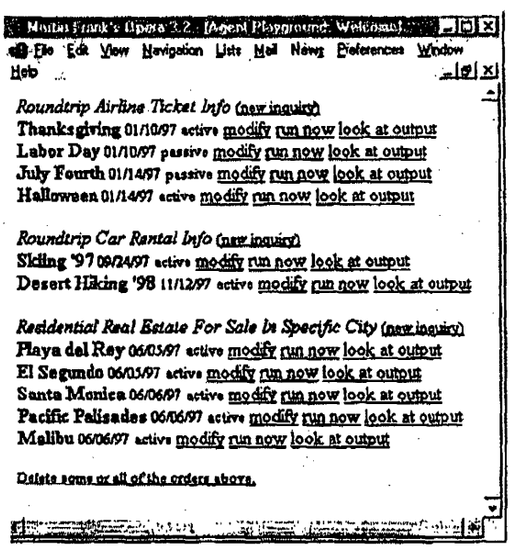


Figure 2: Walkthrough: Welcome Screen

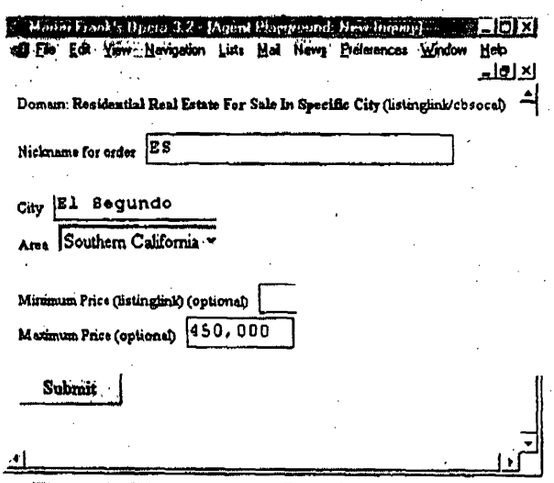


Figure 3: Walkthrough: Entering a new inquiry

Figure 2 shows the initial screen, now based on application domains rather than individual agents.

Figure 3 shows the screen after the user clicked on "new inquiry" for the real estate domain. (Ignore the fact that an inquiry for El Segundo already existed in Figure 2 - we are just re-tracing the steps of the user here for the sake of this walkthrough.) The HyperText Markup Language (HTML) of this page is not hard-coded – it is synthesized on the fly based on the user interface needs description of the available agents in that domain.

Figure 4 shows the result summary for our "El Segundo" inquiry, which first lists the output of the domain-specific agents, followed by a list of links to Web pages produced by automatically scheduled post-processing agents. (We are currently working on improving the readability of the results by better modeling agent output.)

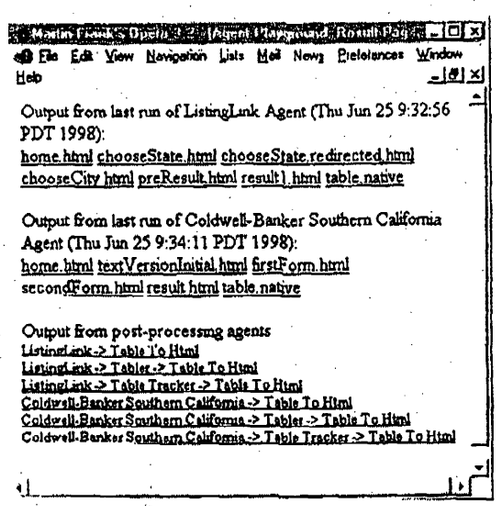
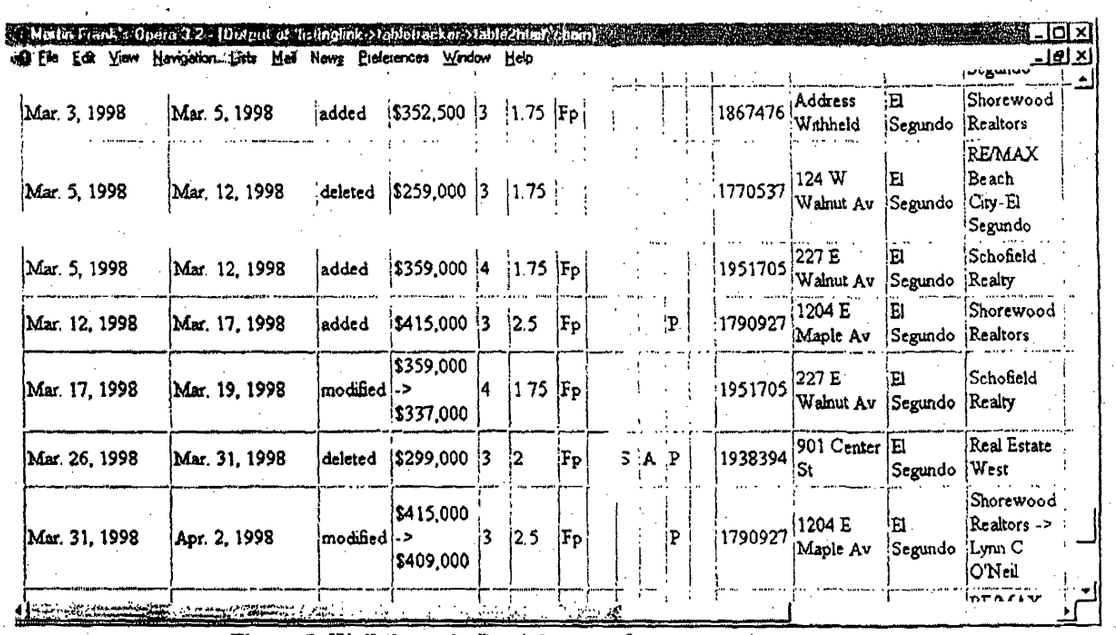


Figure 4: Walkthrough: Result Overview

After receiving a new inquiry, the system automatically schedules times at which the real estate agents will fetch new data (also based on the agents' descriptions as explained later, two times a week in this particular example). An inquiry can also be executed manually via the "run now" links in Figure 2.

Finally, Figure 5 shows the most interesting result data for real estate inquiries. The first two columns of Figure 5 contain the dates between which the change occurred, the third column describes the nature of the change, and the remaining columns reflect the data from the original tables. If the change was a modification, an arrow ("->") points out the old and new values of the column.

The table was produced by a post-processing agent which tracks the changes to a table from run to run; this agent is automatically scheduled for any data-gathering agent that produces a table. In the real estate domain, this results in a compact summary of real estate market developments. For example, a prospective buyer could determine the prior history (changes in listing price, time on the market, etc.) of a property by searching for the street address in this table.



Mar. 3, 1998	Mar. 5, 1998	added	$352,500	3	1.75	Fp				1867476	Address Withheld	El Segundo	Shorewood Realtors
Mar. 5, 1998	Mar. 12, 1998	deleted	$259,000	3	1.75					1770537	124 W Walnut Av	El Segundo	RE/MAX Beach City-El Segundo
Mar. 5, 1998	Mar. 12, 1998	added	$359,000	4	1.75	Fp				1951705	227 E Walnut Av	El Segundo	Schofield Realty
Mar. 12, 1998	Mar. 17, 1998	added	$415,000	3	2.5	Fp			P	1790927	1204 E Maple Av	El Segundo	Shorewood Realtors
Mar. 17, 1998	Mar. 19, 1998	modified	$359,000 -> $337,000	4	1 75	Fp				1951705	227 E Walnut Av	El Segundo	Schofield Realty
Mar. 26, 1998	Mar. 31, 1998	deleted	$299,000	3	2	Fp	3	A	P	1938394	901 Center St	El Segundo	Real Estate West
Mar. 31, 1998	Apr. 2, 1998	modified	$415,000 -> $409,000	3	2.5	Fp			P	1790927	1204 E Maple Av	El Segundo	Shorewood Realtors -> Lynn C O'Neil

Figure 5: Walkthrough: Partial results for our running example

(Disclaimer: We are investigating auto-tracking of commercial web sites' content for academic and personal use only. Any resale or republishing of such data would likely require a license.)

THE AGENT MODELLING LANGUAGE

Declarative agent descriptions are central to synthesizing user input forms on the fly. We will present them here, and subsequently discuss the algorithms operating on them. We have slightly prettified our actual ASCII-based, LISP-ish looking representation for human readability.

Airline Reservation Agents

In addition to the real estate domain, tracking airline fares is another application of the Agent Playground.

The ITN Agent

This section describes the model of the agent that retrieves flight price information from the Web site of the Internet Travel Network (ITN).

Like all our domain-specific agents, it declares which parameters it needs from the user for its query to the Web site. When it is executed, it will first go to the Web site's home page, then possibly follow a number of links and programmatically fill out a number of HTML forms, extracting results along the way by parsing the HTML pages it retrieves in a heuristic manner. It then writes the results to a file in a standard attribute-value format (FlightTime "4:10 hours", RoundTripPrice "$459.00"). These results can then later be post-processed by other agents.

```
Agent itn "ITN Airline Agent"
Domain roundtripAirlineTicketInfo
Description "Lets you determine the ..."
```

The agent's name and description can be used by the Scheduler to present it to the user; "itn" is the internally used short name for the agent. The domain identifies the applicability of the agent (based on simple string matching with the domains of other agents, there is no ontology of agent domains yet).

```
Par apDir
```

Agent parameters starting with lower-case "ap" (the initials of Agent Playground) followed by an upper-case letters are provided by the system whenever an agent is run. Since the semantics of those parameters are built into the system there is no need to elaborate on them in the agent description. Above, the ITN agent indicates that it needs the name of a directory in which it will write its output files. The other current system parameter is *apUser*, which is requested by post-processing agents because it can uniquely identify another job (in combination with an agent name and a job name). We will omit system parameter requests in the remaining agent descriptions.

```
Par itnLogin(
  description="Your ITN login name",
  doNotEcho,takeFromPreferences)
```

The description can be used to prompt the user; we have deleted the description string of all further parameters in this paper for brevity. The caller is instructed not to echo the value of the parameter to the output it produces, and that it should take the value of this parameter from user-specific preferences. Finally, the parameter has no type, meaning that the system should pass the user-provided text to the agent as-is.

```
Par itnPassword(
  doNotEcho,takeFromPreferences)
Par origin(type=AirportCode beginGroup)
```

```
Par destination(type=AirportCode endGroup)
Par initialDepartureMonth(
  type=Month("Jan")
  beginGroup("Initial Departure"))
Par initialDepartureDay(type=Day("1"))
Par initialDepartureTime(
  type=Hour("12 am/6 am/12 pm")
  endGroup)
Par returnDepartureMonth(type=Month("Jan")
  beginGroup("Return Departure"))
Par returnDepartureDay(type=Day("1"))
Par returnDepartureTime(type=Hour("12 am")
  endGroup)
Par airline(
  type=Airline("American")
  legacySynonyms(initialAL,returnAL))
```

The type of the parameter above is Airline, with a type format addendum that requests the airline's name - not symbol - be passed (e.g. "United", not "UA"). There is a finite list of types that are currently recognized by our system, we do not yet have constructable types - if a new agent needs a type outside of the list, the procedural Java code implementing the type ontology must be extended.

The list of legacy synonyms of the *airline* parameter indicates that the agent in the past used different names for this parameter (this is valuable because the system can then compensate for name changes when it tabulates output over time).

The origin and destination parameters above are declared to be an (unnamed) group. Similarly, initialDepartureMonth, initialDepartureDay, and initialDepartureTime logically belong together (making up a group named "Initial Departure").

```
Par initialFlightNo(
  type=AirlineFlightNumber beginGroup)
Par returnFlightNo(
  type=AirlineFlightNumber endGroup)
Par keepAllPages(
  type=Boolean("yes/no"),
  default="no", optional)
Input website("www.itn.com")
Scheduling scheduleAtTimeAndIncrement(
    "H 7 Min 30","Min 5")
```

Each agent describes where its input comes from in a rudimentary form. For example, the input information above is used by the garbage collection agent, which will refuse to delete output from agents that produce "original" output (defined to be those that take their input from external Web sites, rather than from files on disk).

The scheduling information translates to "schedule jobs for this agent at 7:30am, or in five minute increments after that time if a job already exists for the previous times". Thus, jobs can be scheduled for a time that is appropriate for the agents (we may know that a Web site's data tends to get updated at 7am every morning, or that it changes only twice a week), the increment exists to avoid putting a heavy load on the Web site through a large number of automated requests.

Just as the agents describe their input parameters they also describe the attributes of their output (such FlightTime and RoundTripPrice). However, we will omit our representation for describing agent output attributes here because we are still working on the algorithms making use of them.

The Delta Agent

The description of the Delta agent is similar to that of the ITN agent, so that we will only describe differences here.

Most important is the implicit parameter for the airline of value "Delta" (an airline's web site will typically not offer tickets for its competitors). There are also subtle differences in the time input format that the Delta agent expects (e.g. "May 07, 12 Noon", not "May 7, 12 pm).

```
Agent delta "Delta Agent"
Domain roundtripAirlineTicketInfo
Description "Retrieves flight price ..."
Par origin(type=AirportCode beginGroup)
Par destination(type=AirportCode endGroup)
Par initialDepartureMonth(type=Month("Jan")
  beginGroup("Initial Departure"))
Par initialDepartureDay(type=Day("01"))
Par initialDepartureTime(
  type=Hour("12 Midnight/6 AM/12 Noon")
  endGroup)
Par returnDepartureMonth(type=Month("Jan")
  beginGroup("Return Departure")
Par returnDepartureDay(type=Day("01"))
Par returnDepartureTime(
  type=Hour("12 Midnight/6 AM/12 Noon")
  endGroup)
ImplicitPar airline(
  type=Airline, value="Delta")
Par initialFlightNo(
  type=AirlineFlightNumber beginGroup)
Par returnFlightNo(
  type=AirlineFlightNumber endGroup)
Par restrictedFare(
  type=Boolean("yes/no"),default="yes")
Par noOfPassengers(
  type=RangedInteger(1,4),default="1")
Par keepAllPages(
  type=Boolean("yes/no"),default="no",
  optional, doNotEcho)
Input website("www.delta-air.com")
Scheduling scheduleAtTimeAndIncrement(
    "H 7","Min 10")
```

Real Estate Agents

As described in the Introduction, we have also written agents that automatically retrieve real estate information from the Web.

The ListingLink Agent

ListingLink is probably the most comprehensive real estate Web site at the moment. Our ListingLink agent retrieves the homes currently on the market for a given area and city by simulating a user interacting with that Web site. The real estate agents each produce a whole table (of the homes currently available), not just attribute-value pairs as the airline agents do. For that reason, they explicitly describe their output in an Output parameter (describing the name and type of the file, but not yet the semantic contents of the file).

```
Agent listinglink "ListingLink Agent"
Domain residentialRealEstate-
       ForSaleInSpecificCity
Description "Gives you a table ..."
```

```
Par city(type=String(averageLength=20))
Par area(type=RealEstateArea
        legacySynonyms(state))
Par minimumPrice(
      type=String(averageLength=8)
      optional)
Par maximumPrice(
      type=String(averageLength=8)
      optional)
Input website("listinglink.com")
Output singleTypedOutputFile(
      tabular,"table.native")
Scheduling scheduleAtTimeAndIncrement(
      "D Tue,Thu H 20","Min 10")
```

The Southern California Coldwell-Banker Agent

This Web site offers the same type of information, but sometimes lists some properties that are not found in Multiple Listing Service sites such as ListingLink.

```
Agent cbsocal "Coldwell Banker Southern
               California Agent"
Domain residentialRealEstate-
       ForSaleInSpecificCity
Description "Gives you a table of..."
Par city(type=String(averageLength=20))
ImplicitPar area(type=RealEstateArea,
      value="Southern California")
Par maximumPrice(
      type=String(averageLength=10)
      optional)
Input website("www.cbsocal.com")
Output singleTypedOutputFile(
      tabular,"table.native")
Scheduling scheduleAtTimeAndIncrement(
      "D Tue,Thu H 20 Min 5","Min 10")
```

Domain-Independent Post-Processing Agents

In addition to the "wrapper" agents for particular web sites we also wrote a number of post-processing agents which tabulate and present data from the wrapper agents. This tabulation could occur on user demand, or could be pre-processed every time new data is produced. We have take the latter approach because the data sets are often large so that post-processing can sometimes take 2-3 minutes. In addition, our architecture allows other post-processing agents to be added later which will then automatically be scheduled

.

The Tabler Agent

The *tabler* agent puts the data that other agents have produced over time in a tabular format. For example, imagine that it post-processes the attribute-value output from a simplistic car rental agent that just writes out the time it ran and how much the specified car rental would cost, and that this agent job was run 12 times. The *tabler* would then gather the attribute-value pairs for each run from disk, and produce a table two columns wide and twelve rows high (with the columns containing the values for the date and the price).

The empty *Domain* field below indicates that it is always applicable. The *Scheduling* field indicates that the agent should be scheduled after every job of an agent that gathers input from an external web site, and that the *agent* and *order* parameters should be filled in with the information that identifies the agent whose data we are tabling. No *Input* description is necessary because the input of the agent is implied in the *Scheduling* information.

```
Agent tabler "Tabler Agent"
Domain
Description "Makes a table out of ..."
Par agent(type=AgentShortName)
Par order(type=JobId("19961224173000"))
Output singleTypedOutputFile(
      tabular,\"table.native\")",
Scheduling scheduleForEveryAgentJob(
      agent,order) agentMustBeOriginal()",
```

The Table-Tracker Agent

Some original agents such as the real estate not only produce single attributes-value pairs as output (such as the number of listings retrieved) but also additionally write whole tables of information (such as the listing of homes on the market). For these agents, the Table Tracker can compute a table that summarizes the history of changes in a time series of tables. This resulting table of changes lists two points in time between which the change occurred, then lists the type of change, and then the entries from the original tables (see Figure 5 for an example).

```
Agent tabletracker "Table Tracker"
Domain
Description "Summarizes the changes to ..."
Par agent(type=AgentShortName)
Par job(type=JobId("19961224173000"))
Par inputFile(type=RelativeFileName
      optional default("table.native"))
Output singleTypedOutputFile(
      tabular,\"table.native\")
Scheduling scheduleForEveryFileOfType(
      tabular,agent,job,inputFile)
      agentMustBeOriginal()
```

The Web-Page Producer

This agent takes a table in our native format and produces an HTML version of it.

```
Agent table2html "Table To HTML"
Domain
Description "Produces a nice-looking ..."
Par a(type=Agent)
Par j(type=JobId("19961224173000"))
Par f(type=RelativeFileName
      optional default("table.native"))
Output singleTypedOutputFile(
      html,"table.html")
Scheduling scheduleForEveryFileOfType(
      tabular,a,j,f)
```

DECIDING WHICH AGENTS SHOULD BE INVOLVED FOR A DOMAIN

There are two stages to generating a domain-specific inquiry entry form. This section describes the first step, which consists of deciding which agents should be involved, in what order, and when they should be run. The next section will then describe the second step of generating a user interface once it is known which agents are involved.

We named the sub-system for the first step the Scheduler. Given a domain identifier (a simple string) it will first gather all agents in that domain, and schedule them for the time

:hat each asked for in its *Scheduling* field. If that time slot is already taken by a run of the same agent, it will be scheduled for the first available time slot, based on the increment given in the *Scheduling* field.

The Scheduler will then recursively add post-processing agents to the original domain agents until no more post-processing agents are applicable. The current post-processing agents are of two categories: agents that apply after each original agent, and agents that apply after others that write files of a certain type (the latter may also be restricted to original agents, or may not be). The *tabler* falls into the former category because there are always some output attributes for any agent run – even if an agent does not produce any output, the Daemon running it will add some standard output attributes such as when the agent was run, and how long it took to execute it.

Each post-processing agent will point out the parameters it expects to be filled in, which identify on what data it will run (consisting of an agent short name, a job id, and possibly the name of the file that they are post-processing). The Scheduler adds this information as it constructs the agent chain.

In the airline domain, this process results in the agent order shown in Figure 6. We are currently working on modeling agent output in enough detail so that we can also combine the *output* from several different original agents in a meaningful way. For now, the Agent Playground does not combine data from different agents.

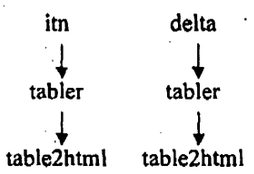


Figure 6: Resulting Agent Chain, Airline Domain.

Figure 7 shows the chain of agents for the real estate domain.

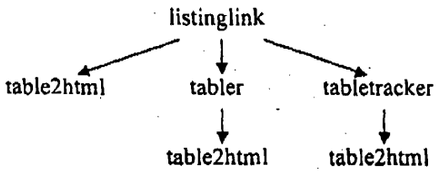


Figure 7: Resulting Agent Chain, Real Estate Domain.

The *tabler* is scheduled after *listinglink* because it produces attribute-value data. *tabletracker* and the immediate *table2html* run after *listinglink* are scheduled because it produces a tabular data file. From left to right, the resulting three tables answer the following questions. (We have omitted an equivalent graph for the *cbsocal* agent.)

- At what times did *listinglink* run, how long did each run take, and how many homes overall were on the market when the agent ran?
- What were the changes in the market over time (as in Figure 5)?
- What is the most recently retrieved list of homes currently on the market?

GENERATING THE DOMAIN-SPECIFIC END-USER INTERFACE

The user interface for giving instructions to the agents within one domain is synthesized based on the agent descriptions, an ontology of the parameter types requested by the agents, and a storage facility for parameters that are applicable to more that one inquiry. We will first discuss the latter two sub-components, and then describe the user interface generation process.

The Agent Parameter Ontology

We maintain a central ontology of parameter types that is used to check the validity of given types and to translate between different formats for these types.

Both the scope and the implementation of this ontology are primitive. The types covered by the ontology are only those that we needed for the airline domain, the car rental domain, and the real estate domain (the domains overlap, of course, especially the airline and car rental domains).

The questions that can be asked of the ontology are the following:

- Is the given string a valid parameter type?
- Do the following two strings represent the same value for a given type?
- For a given type ("Day"), type format identifier ("01"), and value ("7"), what is the correct representation for that value? (The answer is "07".)
- For a given enumerated type, what are all possible values, in the canonical type format? For example, the values of type Month are "Jan".. "Dec".
- For a given textual type, what is the average number of characters needed? (An AirportCode is 3 characters long.)

The Preferences Repository

The Scheduler also maintains a file of user preferences in simple attribute-value format. If an agent declares that a certain parameter should be taken from the preferences (such as *itnLogin* and *itnPassword* for the ITN agent), the Scheduler will take its value from there. If it is not found, it will appear as a regular-entry field this time, and be put in the preferences file for future use when the user submits the form.

The User Interface Generation Algorithm

Based on the order of agents applicable to this domain computed in Step 1, we can obtain a list of parameters needed. Some of these parameters will have already been

filled in by the Scheduler in Step 1, such as the parameters identifying the preceding job for post-processing agents. Some others are supplied by the Daemon whenever a job is run, such as the directory to write output to.

We group the remaining parameters into required and optional ones, retaining the order of parameters listed by the first agent encountered. Parameters of subsequent agents are added at the end of the list (unless their name and type matches an existing parameter, in which case they are not added at all).

From that list of user parameters needed, we remove those that indicate that they should be taken from the preferences (assuming the preferences actually contain a value for them).

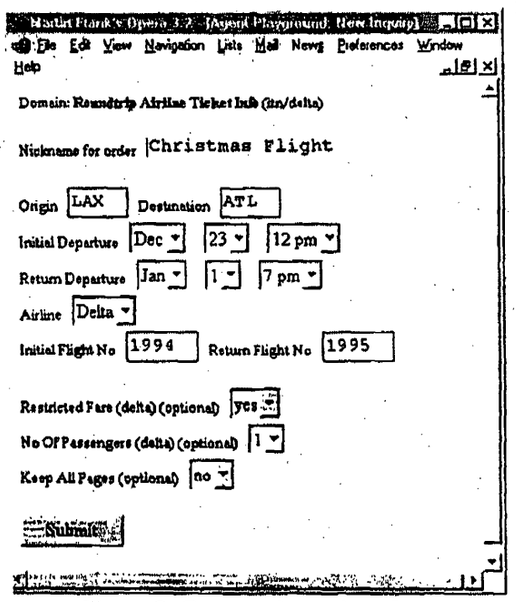


Figure 8: Generated user interface for the airline domain

For any remaining parameter, we query the parameter ontology for a possible default value, plus either for all its possible values (enumerated types) or for its textual length (non-enumerated ones). Finally we put parameters bracketed by the *beginGroup* and *endGroup* constructs in the same line. If the *beginGroup-endGroup* construct provides a name for the group we will omit individual field names and use the group name as a label describing all of them.

Figure 8 shows the user filling out the form that is automatically generated for the airline domain. For example, the "Initial Departure" line consists of a named group, the "Initial Flight No." line is an unnamed group. For parameters not requested by all agents involved, we list the short names of the agents asking for them (as in the "Restricted Fare" line).

Figure 3 in the Introduction is a similar, simpler example of an inquiry entry form that was generated in the same way.

IMPLEMENTATION

The Agent Playground is a Web site based on Java servlets. It can be used with any browser that supports HTML forms and tables. A "daemon" Java process runs in the background, and wakes up every five minutes in order to check the running instructions of each user inquiry and executes the inquiries if they became due.

We are currently in the process of converting the user input forms (Figures 3 and 8) from simple HTML forms to our Adaptive Forms [4], which have the advantage that they can encode some dependencies between fields.

RELATED WORK

Our research is most related to "model-based" user interfaces, which do not hard-code their graphical user interfaces but instead assemble them on the fly from declarative specifications of what is to be presented to the user [3,6,7]. Our user interfaces only consist of simple forms, on the other hand we try to infer not only the user interface from the specifications but in a limited sense also assemble the application itself on the fly (which agents should be involved, and in which order).

On the software agents side, our work is related to automated information retrieval agents [2,5]. Our focus is different in that our agents themselves are deterministic and distinctly un-intelligent; our emphasis is instead on intelligence in the user interface.

One particularly interesting information retrieval agent is ShopBot [1] which is a software robot that given a list of on-line vendors' Web sites and a set of product descriptions to search for can learn how to query those sites for price information. This is done by first looking for pages that resemble a search form, and by then repeatedly filling in permutations of the given product description into the search form until the result page looks like a product description for the product examples. Once ShopBot has learned how to find and fill in the search form for a particular vendor, it can retrieve product information for that vendor instantly, and end-users can issue simultaneous queries against multiple vendors. ShopBot is superior to our individual agents in the sense that its wrapping of sources is more robust (less likely to break if Web sites are re-designed). We believe our system is of value if the user explicitly wants to track sources over time (ShopBot answers questions of the kind "what is available right now"), or in domains where there are few Web sources of interest (so that writing agents to retrieve information from each manually is actually simpler and faster than modeling the domain in such detail so that a generic software robot could retrieve the information).

FUTURE WORK

There are numerous shortcomings in our current implementation. For example, we should use an existing AI planner rather than our ad-hoc scheduling algorithm, and knowledge about parameter types should be stored

declaratively.

We are currently working on better modeling the output of agents so that we can present results by their semantics rather than by the agent chain that produced them (as was done in Figure 4). In addition, more detailed modeling will also enable combining the output from several parallel agents, so that e.g. the query results for several airline agents can be summarized in a single table (rather than in one table per agent as we do now).

We also want to add a post-processing agent that sends email when specified changes occur. The input parameters to this agent will depend on the output of previous agents. For example, the user should be able to select "price" as an attribute of interest only if the preceding agents actually produce such an attribute. This should also be possible with more detailed agent output modeling.

CONCLUSION

The Agent Playground presents a very small step towards a full-fledged application that can dynamically adapt its user interface to new functionality added on the fly. We nevertheless believe that architectures in which agents describe their user interface needs declaratively represent a promising new research direction.

ACKNOWLEDGMENTS

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A Softbot-Based Interface *to the Internet*

Oren Etzioni

The Internet Softbot (software robot) is a fully implemented AI agent developed at the University of Washington [5]. It uses a Unix shell and the World-Wide Web to interact with a wide range of Internet resources. Effectors include `ftp`, `telnet`, `mail`, and numerous file manipulation commands; sensors include Internet facilities such as `archie`, `gopher`, `netfind`, and many more. The softbot is designed to incorporate new facilities into its repertoire as they become available.

The softbot's "added value" is threefold. First, it provides an integrated and expressive interface to the Internet. Second, the softbot dynamically chooses which facilities to invoke, and in what sequence. For example, the softbot might use `netfind` to determine David McAllester's email address. Since it knows `netfind` requires a person's institution as input, the softbot would first search bibliographic databases for a technical report by McAllester that reveals his institution. Third, the softbot fluidly backtracks from one facility to another based on information collected at run time. As a result, the softbot's behavior changes in response to transient system conditions (e.g., the UUCP gateway is down). In this article, we focus on the ideas underlying the softbot-based interface.

The Interface

By acting as an intelligent personal assistant, the softbot supports a qualitatively different kind of human-computer interface. A person can make a high-level request, and the softbot uses search, inference, and knowledge to determine how to satisfy the request. Furthermore, the softbot is able to tolerate and recover from ambiguity, omissions, and errors in human requests.

At its core, the softbot can handle goals specified in an expressive subset of first-order logic. In particular, conjunction, disjunction, negation, and universal quantification can be composed to specify goals for the softbot. Since naive users are uncomfortable with logical notation, we have implemented a menu of request forms (Figure 1) which can be sent to the softbot via email, from mosaic, or through an X-windows graphical user interface. A filled-in form is automatically translated into a softbot goal (Figure 2). In principle, any dialog modality (e.g., natural language, speech, and pen interfaces) could be used to communicate with the softbot; we need only add a module to translate to and from the softbot's logical language.

In designing our interface, we have deemphasized issues of "look and feel" of the interface, and focused on how to leverage the softbot's AI capabilities to increase the interface's expressive power and flexibility. Specifically, our softbot-based interface embodies the following ideas:

1. ***Goal oriented.*** A request indicates *what* the human wants. The softbot is responsible for deciding *how* and *when* to satisfy the request.
2. ***Charitable.*** A request is not a complete and correct specification of the human's goal, but a *clue* or a *hint* that the softbot attempts to decipher and then satisfy.[1]

3. ***Balanced.*** The softbot has to balance the cost of finding information on its own, against the nuisance value of pestering the human with questions.

4. ***Integrated.*** The softbot provides a single, expressive, and uniform interface to a wide variety of Internet services and utilities.

Consider the task "Send the budget memos to Mitchell at CMU." A human assistant would handle this request with ease, but most existing software agents would not. Even if one solves (or circumvents) the problem of natural-language understanding, the agent still has to figure out:

- Which Mitchell was intended?
- Which documents should be sent? (and where are they located?)
- How to transmit the memos? (email, fax, remote printing, and so forth.)
- What if the memos are confidential?
- What if Mitchell is out of town?

As this simple example illustrates, even mundane human requests are incompletely specified, potentially ambiguous, or even impossible to satisfy (what if there is no Mitchell at CMU?).

The softbot's first task is *disambiguation*. It has to decide what "objects" the request is referring to: for instance, who is the intended recipient of the memos? The request suggests that the memos ought to go to a person named Mitchell at CMU, but there may be several people at CMU who share the same last name. The softbot could adopt the policy of asking the human to specify the recipient more clearly whenever his full name is not provided, but this is inappropriate. A last name *could* potentially pick out a unique individual. For example, suppose the last name provided is "Satyanarayanan." In this case, the softbot's request for clarification would be gratuitous and annoying. In general, any description, however tenuous, might pick out a unique individual. Before asking questions, the softbot ought to *check* whether the given description is ambiguous.

The softbot could consult its knowledge base to see how many Mitchells it "knows" at CMU, but suppose the softbot is familiar with only one, can it be sure that it is familiar with *all* the Mitchells at CMU? Since its knowledge of people on the Internet is bound to be radically incomplete, the softbot cannot afford to make the *closed world assumption* made by many AI and database systems [13]. Thus, it cannot automatically conclude that there is only one Mitchell at CMU from the fact that it is *familiar* with only one. Fortunately, it is easy to find all the Mitchells at CMU (by executing `finger mitchell@cmu.edu`). The softbot executes this command, records who are the various Mitchells at CMU, and (if necessary) prompts the human with a request to choose the intended one. The softbot also records, for future reference, that it is now familiar with all the Mitchells at CMU. Despite its incomplete knowledge, the softbot can recognize when it has complete information on a particular topic or locale [4].

To resolve ambiguity, the softbot could try to infer who the intended Mitchell is based on the documents being sent and the context of the request (e.g., did the human just receive an email message from some Mitchell at CMU?). While plausible inference of this sort can be encoded within our softbot framework, our implementation is not that sophisticated, yet.

Currently, the softbot attempts to find all individuals or objects on the Internet matching a given description. If there is a single resource that provides this information, the softbot will access it (by fingering in the previous example). Otherwise, the softbot will form a plan to seek out matching individuals. If the description is not constrained appropriately, executing such a plan can be very expensive. For instance, suppose the human omits Mitchell's location in request. The softbot would be "tempted" to search the entire Internet looking for Mitchells. However, the balance principle implies that the softbot would be better off asking the human to further constrain Mitchell's description. Thus, before disambiguating, the softbot estimates the cost of its disambiguation plan. When the cost is high, the softbot prompts the human for more information: "I am not sure which Mitchell you mean, can you tell me Mitchell's workplace, city, or field of interest?"

Once the appropriate Mitchell (and memos) have been determined, the softbot's second task is to actually send the memos to Mitchell. The softbot may decide to email the memos, but first it has to find Mitchell's email address, and reason about document format. For example, if a document contains figures, then sending the postscript version is more appropriate than sending the LaTEX source. Furthermore, if Mitchell is out of town, or if the memos are confidential, the softbot has to ensure that the memos reach their recipient in a timely and secure manner.

In general, after the softbot has figured out what the human wants, it considers how to satisfy the human request. The softbot solves this problem by invoking an automatic planning algorithm.

Softbot Planning

To construct an *integrated* and *goal-oriented* interface, we use AI planning techniques. The softbot planner takes a logical expression describing the user's goal as input. After searching a library of *action schemata* describing available information sources, databases, utilities and software commands, the planner generates a sequence of actions that achieve the goal.

Unlike standard programs and scripts which are committed to a rigid control flow determined *a priori* by a programmer, the softbot's planner automatically synthesizes and executes plans to achieve the inputted goals. This avoids the problematic task of writing programs that anticipate and adapt to all possible changes in system environment, network status, and error conditions. In short, a softbot is worth a thousand shell scripts.

[1]When the request is unethical or dangerous, the most appropriate response may be to alter or even refuse the request [14, 16].

The softbot's planner accepts an expressive goal language, enabling the softbot to accept goals containing complex combinations of conjunction, disjunction, negation, and nested universal and existential quantification. Furthermore, the softbot's use of planning yields an integrated interface—users can write expressive goals, even when dealing with services that don't support them directly. Consider the task "Get all of Ginsberg's technical reports that aren't already stored locally." Through planning, the softbot can use `ftp` to handle this request, even though the `ftp` utility doesn't know which files are local, and does not handle this combination of universal quantification and negation. The softbot will determine which of Ginsberg's reports are not stored locally, and will issue `ftp` commands to obtain them.

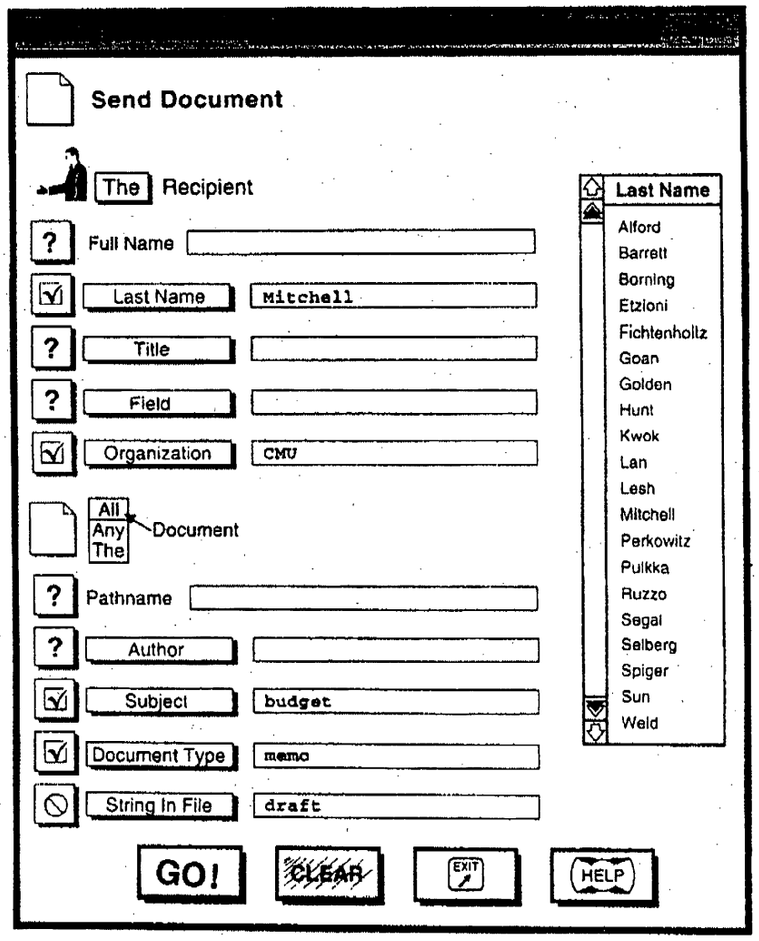
The softbot planner is implemented as a search process over partially specified action sequences called *plans*. The planner is able to decompose complex goal expressions into their constituents and solve them with divide and conquer techniques. Interactions between subgoals are automatically detected and resolved. Space precludes comprehensive discussion of the algorithm (see [4, 14]). However, we note that modern planning algorithms are provably

- complete: if a plan exists, the planner will find it, and
- sound: if the planner outputs a plan, that plan is guaranteed to achieve its goal (modulo certain explicit assumptions).

While these formal guarantees do not ensure the planner is efficient, we have not found efficiency to be a problem in practice. The softbot planner accepts control heuristics, specified in a high-level, declarative language, which constrain the planner's search by instructing it to prefer certain options over others, avoid blind alleys, and so forth. These heuristics can be hand-coded or generated automatically via machine learning techniques [6, 12].

If the softbot cannot satisfy its goal directly, it will automatically subgoal on an indirect way of satisfying the goals. For example, if looking up the phone number of a graduate student fails, the softbot will subgoal on identifying the student's office mates and finding their phone number. The softbot relies on an inference rule which states that office mates share the same telephone.

Figure 1. The request form for sending a document. In general, users need only provide a partial specification of the desired goal. The softbot disambiguates the request and plans how to achieve it, subgoaling and backtracking as required.



Resource Integration

The planner relies on a logical model of the available Internet resources, which answers two questions: how can the softbot invoke or access the resource, and what is the effect of doing so? This sort of "resource model" can be viewed as a generalization of a Prolog inference rule to allow for multiple effects, nested universal and existential quantification, and state change. The precise syntax and semantics of our representation language are described in [3, 4].

This declarative representation enables the softbot to integrate multiple, independent Internet facilities in service of its goals. For instance, as mentioned earlier, the softbot's model of `netfind` (Figure 3) tells it that it has to know a person's institution (or city) before accessing the `netfind` facility. Thus, when necessary, the softbot subgoals on finding this information by invoking different facilities (e.g., it might search the INSPEC database `grep` through local bibliographic databases). Further-

more, the softbot is poised to leverage new Internet resources. When a new facility becomes available, we need only write the appropriate logical models and search control rules to update the softbot. We are also investigating the use of learning techniques to help automate this task.

```
(forall (?d :in  files)
    (if (and (file.type ?d memo.document)
             (subject.of.document ?d "budget")
             (not (string.in.file "draft" ?d)))
        (delivered.to ?d ?obj341)))
```

Figure 2. The form shown in Figure 1 is automatically translated into an internal representation similar to the one shown here. During this process, the softbot executes actions as needed in order to find a unique person object.

```
Name:       (netfind ?person)
Preconds:                          Postconds:
   (current.shell csh)                (userid ?person !userid)
   (isa netfind.server ?server)       (person.machine ?person !machine)
   (firstname ?person ?firstname)
   (lastname ?person ?lastname)
   (or (person.city ?person ?keyword)
       (person.institution ?person ?keyword))
```

Figure 3. An action schema encoding the netfind utility. The softbot planner uses the schemata to determine when an Internet service could help achieve a user goal.

Incomplete Specification

The softbot accepts incompletely specified goals, and searches for missing information whenever possible. For example, if asked to print a file on "any free printer in the building," the softbot will find the printer list in a database, and will check the status of each printer until it finds one that is free. Similarly, if a human asks to be notified when Etzioni logs on to some machine at the University of Washington, the softbot will search for machines where Etzioni has an account and will monitor these machines until he appears. In general, the softbot's goal language allows the human to state three kinds of goals:

- *Ground goals:* notify me when Etzioni logs on to the machine called June.cs.washington.edu.
- *Existentially quantified goals:* notify me when Etzioni logs on to *some* machine.
- *Constrained goals:* notify me when Etzioni logs on to some computer-science machine at the University of Washington.

Empirically, we have found that constrained goals strike a useful balance between burdening the user with endless questions, and sending the softbot on a massive search of the Internet.

The use of a modern algorithm for planning with incomplete information is one of the most distinctive features of our softbot. In contrast, much of the current work on intelligent software agents focuses on task-specific "bots" for visitor scheduling [10], meeting scheduling [1], email filtering [11], white-page services [2], and so forth. While each of these agents has its strengths, none share the benefits of the planning approach including a highly expressive goal language, automatic backtracking and subgoaling, and more.

Softbot Safety

We have argued that in order to provide an integrated, goal-oriented interface, one needs powerful tools such as the softbot. However, the softbot also requires safety features. Of course, this is true of any software tool (e.g., the Macintosh refuses to reformat one's startup disk), but safety is more important for more powerful tools. Just as in the carpentry domain (where a table saw can slice through a tendon) Internet power tools, like the softbot, are capable of inflicting damage when used indiscriminately.

The greatest danger lies in the softbot's very ability to plan how to achieve the user's goal. Note that using a sound planner (i.e., one that only generates plans which are guaranteed to achieve the goal) is not sufficient, since there may be *many* such plans with different side effects. Consider the task "Reduce disk utilization below 90%." If the softbot succeeded by deleting irreplaceable LaTEX files without backing them up to tape, then users might prefer less "powerful" tools!

We believe that the softbot's safety mechanism should ensure the following qualities:

- *Safety.* The softbot should refuse to make destructive changes to the world.
- *Tidy.* The softbot should restore the world as close as possible to its original state (i.e., recompress files after searches).
- *Thrifty:* The softbot should limit its use of valuable resources.
- *Vigilant.* The softbot should block human actions that have unintended consequences.

See [14] for a formalization of some of these ideas in a manner that supports computationally tractable implementation. Since the ideas reported therein are preliminary and as yet unimplemented, we acknowledge that softbot safety is an area that deserves substantially more investigation.

Conclusion

Software environments such as the Internet are attractive testbeds for AI research [7]. Softbots circumvent many thorny issues that are inescapable in physical environments. Furthermore, the cost, effort, and expertise necessary to develop and experiment with software artifacts are relatively low. Yet, in contrast to simulated worlds, software environments are readily available, economically important, and *real*. In the past three years, the focus of the Internet Softbots project has been on the AI problems of designing and building an agent capable of effectively exploring the Internet. For a sample of technical AI results achieved in this context refer to [3, 4, 9].

We are now leveraging the softbot's AI capabilities to develop an expressive, goal-oriented, and charitable interface to the Internet. In contrast to a loosely structured browser such as Mosaic, our long-term objective is to develop an interface that will enable naive users to locate, monitor, and transmit information across the Net.

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Paper No. 6

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In re Application of :
Greg Freishtat, et al.
Application No.: 09/428,511
Filed: October 27, 1999
For: APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

DECISION ON PETITION TO MAKE SPECIAL

This is a decision on the petition under 37 C.F.R. § 1.102, filed February 8, 2000, to make the above-identified application special.

The petition requests that the above-identified application be made special under the procedure set forth in M.P.E.P. § 708.02, item II: Infringement.

A grantable petition under 37 C.F.R. § 1.102(d), M.P.E.P. § 708.02, item II: Infringement, must be accompanied by the required fee and a statement alleging:

(1) that there is an infringing device or product actually on the market or method in use;

(2) that a rigid comparison of the alleged infringing device, product, or method with the claims of the application has been made, and that, in his or her opinion, some of the claims are unquestionably infringed; and

(3) that he or she has made or caused to be made a careful and thorough search of the prior art or has a good knowledge or the pertinent prior art.

Further, Applicant must provide one copy of each of the references deemed most closely related to the subject matter encompassed by the claims if said references are not already of record.

The petition is **GRANTED**.

The application will retain its special status throughout its entire course of prosecution in the Patent and Trademark Office, including appeal, if any to the Board of Patent Appeals and Interferences, subject only to diligent prosecution by the applicant.

The application file will be forwarded to the examiner for expedited prosecution.

Kenneth A. Wieder
Special Program Examiner
Technology Center 2700
Communications & Information Processing
(703) 305-4710

Transaction History Date 2000-06-13
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Page 1 of 1

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
KMC	AA	6,[illegible]	2/22/00	Chow et al.	707	104	
	AB	5,913,202	6/15/99	Motoyama	705	35	
	AC	5,893,091	4/6/99	Hunt et al.	707	3	
	AD	5,884,033	3/16/99	Duvall et al.	709	206	
	AE	5,712,979	1/27/98	Graber et al.	709	224	
KMC	AF	5,537,314	7/16/96	Kanter	705	14	

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OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER: Kenneth Coulter | DATE CONSIDERED: 9/27/2000

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	FILING DATE: October 27, 1999	GROUP: ~~2765~~ 2154

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KHC	AA	5,347,632	9/13/94	Filepp et al.	709	202	

FOREIGN PATENT DOCUMENTS

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER: Kenneth Coulter	DATE CONSIDERED: 8/27/2000

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

W061307

Transaction History Date 2000-10-02
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

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Patent and Trademark Office
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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/428,511	10/27/99	[illegible]	

LM02/1103

NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

EXAMINER	
[illegible]	
ART UNIT	**PAPER NUMBER**
[illegible]	10

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev. 2/95)
U.S. G.P.O. 2000 ; 465-188/25268

1- File Copy

Office Action Summary	Application No. 09/428,511	Applicant(s) Freishtat et al.
	Examiner Kenneth R. Coulter	Group Art Unit 2758

☐ Responsive to communication(s) filed on _____

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-28 is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-28 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5,7,8,9

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1 - 28 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 - 9 of copending Application No. 09/427,602. Although the conflicting claims are not identical, they are not patentably distinct from each other because both set of claims disclose an automated personal information delivery system to deliver data from personal information storage.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 - 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Experton (U.S. Pat. No. 5,995,965) (System and Method for Remotely Accessing User Data Records) in view of Reed et al. (U.S. Pat. No. 5,862,325) (Computer-Based Communication System and Method Using Metadata Defining a Control Structure).

4.1 Regarding claim 1, Experton discloses a system for delivering personal information from at least one information provider to at least one end user comprising:

a user store for storing end user data associated with each end user (Abstract; Fig. 1, item 104);

a provider store for storing information provider data associated with each information provider (col. 5, lines 50 - 54; col. 6, lines 1 - 19);

a personal information store for storing personal information associated with each end user (Abstract; Fig. 1, item 304).

"**User data records**, such as health or financial data, are **stored in a data base at one or more remote facilities** ..." (Abstract).

processor in communication with the user store, the provider store and the personal information store (Fig. 1, item 202), for performing the steps of:

for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers (Fig. 1; Abstract); and

storing the retrieved personal information in the personal information store (Fig. 1, items 104, 114; col. 4, lines 38 - 50)

"The remote processor, which is also connected to the network, verifies the record request and downloads all of a requested or predetermined part of the corresponding user data records to the local processor. This data may then also be downloaded at least in part to the **memory of the user's card**." (Abstract)

However, Experton does not explicitly disclose that the processor in communication with the user store, the provider store and the personal information store, for performing the steps of:

connecting with at least one information provider.

Reed et al. (hereafter Reed) teaches the **automated** communication transferal of data from a **provider** to a **consumer** (Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention for the processor to connect with at least one information provider because some sort of connection must occur in order for the record data at the provider (remote processing facility 300) to be downloaded on demand by the portable access device 100.

4.2 Per claims 2 - 13, Experton clearly teaches the specifics involving monitoring information providers (Abstract; Fig. 1, item 200); updating the provider store (Abstract: "Updates to the user's data records may also be uploaded from the local processor to the remote processing facility, or downloaded to the card, or both."); processor automatically executing transactions according to end user data (Abstract; Fig. 1, item 200); outputting personal information from the personal information store (Fig. 1, item 800; col. 8, lines 9 - 12); the

personal information outputted as a Web page to a web site (Abstract: "The network is preferably a publicly accessible network such as the Internet").

4.3 Regarding claims 14 - 28, the rejection of claims 1 - 13 under 35 USC 103 (paragraphs 4.1 and 4.2) applies fully.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth Coulter whose telephone number is (703) 305-8447.

KENNETH R. COULTER
PRIMARY EXAMINER

krc

September 30, 2000

Notice of References Cited

Application No.	Applicant(s),
09/428,511	Freishtat et al.

Examiner	Group Art Unit	
Kenneth R. Coulter	~~2756~~ 2154	Page 1 of 1

U.S. PATENT DOCUMENTS

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,995,965	11/1999	Bettina Experton	707	10
B	5,978,779	11/1999	Stein et al.	705	37
C	5,696,965	12/1997	Rick Dedrick	707	10
D	5,724,567	3/1998	Daniel E. Rose	707	2
E	5,862,325	1/1999	Reed et al.	709	201
F					
G					
H					
I					
J					
K					
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FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		

Form PTO 948 (Rev. 8-98) U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office Application No. 09/428511

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 10/27/99 are:

A. ☐ approved by the Draftsperson under 37 CFR 1.84 or 1.152.

B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be sumitted according to the instructions on the back of this notice.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color.
   - ___ Color drawings are not acceptable until petiton is granted. Fig(s) _____
   - ___ Pencil and non black ink not permitted. Fig(s) _____
2. PHOTOGRAPHS. 37 CFR 1.84 (b)
   - ___ 1 full-tone set is required. Fig(s) _____
   - ___ Photographs not properly mounted (must use brystol board or photographic double-weight paper). Fig(s) _____
   - ___ Foor quality (half-tone). Fig(s) _____
3. TYPE OF PAPER. 37 CFR 1.84(e)
   - ___ Paper not flexible, strong, white, and durable. Fig(s) _____
   - ___ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) _____
   - ___ Mylar, velum paper is not acceptable (too thin). Fig(s) _____
4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:
   - ___ 21.0 cm by 29.7 cm (DIN size A4)
   - ___ 21.6 cm by 27.9 cm (8 1/2 x 11 inches)
   - ___ All drawing sheets not the same size. Sheet(s) _____
   - ___ Drawings sheets not an acceptable size. Fig(s) _____
5. MARGINS. 37 CFR 1.84(g): Acceptable margins:

   Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm
   SIZE: A4 Size

   Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
   SIZE: 8 1/2 x 11

   Margins not acceptable. Fig(s) _____
   _____ Top (T) _____ Left (L)
   _____ Right (R) _____ Bottom (B)
6. VIEWS. 37 CFR 1.84(h)
   REMINDER: Specification may require revision to correspond to drawing changes.
   Partial views. 37 CFR 1.84(h)(2)
   - ___ Brackets needed to show figure as one entity. Fig(s) _____
   - ___ Views not labeled separately or properly. Fig(s) _____
   - ___ Enlarged view not labeled separetely or properly. Fig(s) _____
7. SECTIONAL VIEWS. 37 CFR 1.84 (h)(3)
   - ___ Hatching not indicated for sectional portions of an object. Fig(s) _____
   - ___ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____
8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
   - ___ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____
9. SCALE. 37 CFR 1.84(k)
   - ___ Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____
10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(i)
    - ___ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) _____
11. SHADING. 37 CFR 1.84(m)
    - ___ Solid black areas pale. Fig(s) _____
    - ___ Solid black shading not permitted. Fig(s) _____
    - ___ Shade lines, pale, rough and blurred. Fig(s) _____
12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)
    - ___ Numbers and reference characters not plain and legible. Fig(s) _____
    - ___ Figure legends are poor. Fig(s) _____
    - ___ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____
    - ___ English alphabet not used. 37 CFR 1.84(p)(2) Figs _____
    - ☒ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) 1-4, 5, 8-11
13. LEAD LINES. 37 CFR 1.84(q)
    - ___ Lead lines cross each other. Fig(s) _____
    - ___ Lead lines missing. Fig(s) _____
14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)
    - ___ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) _____
15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
    - ___ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____
16. CORRECTIONS. 37 CFR 1.84(w)
    - ___ Corrections not made from prior PTO-948 dated _____
17. DESIGN DRAWINGS. 37 CFR 1.152
    - ___ Surface shading shown not appropriate. Fig(s) _____
    - ___ Solid black shading not used for color contrast. Fig(s) _____

COMMENTS

REVIEWER Q.D DATE 9/11/00 TELEPHONE NO. _____

ATTACHMENT TO PAPER NO. _____

ATTORNEY DOCKET NO. 220220003
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Freishtat et al.

Serial No.: 09/428,511

Filed: October 27, 1999

For: " APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA"

Group Art Unit: 2755

Examiner: Coulter, K.

AMENDMENT UNDER 37 C.F.R. § 1.111

BOX AMENDMENT
Assistant Commissioner for Patents
Washington, D.C. 20231

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

April 2, 2001

Sir:

This amendment is in response to the Office Action dated October 3, 2000. Please amend the above-identified application as follows:

IN THE CLAIMS:

Please replace the entire set of pending claims (claims 1-28) with the following clean set, pursuant to 37 C.F.R. § 1.121(c)(3):

20 1. A system for delivering non-public personal information relating to an end user via a network from at least one of a plurality of information providers, the information providers securely storing the personal information, the system comprising:

(a) a user store for storing end user data associated with each end user, the user store including information identifying the plurality of information providers securely storing the personal information relating to the end user;

(b) a provider store for storing information provider data associated with each information provider, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information;

(c) a personal information store for storing personal information associated with each end user retrieved from the information providers;

(d) a processor in communication with the user store, the provider store and the personal information store, for performing the steps of:

(i) connecting with at least one information provider;

(ii) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers; and

(iii) storing the retrieved personal information in the personal information store for accessible to the selected end user.

2. The system of claim 1, wherein the processor performs the additional step of monitoring information providers for changes.

3. The system of claim 1, wherein the processor performs the additional step of updating the provider store to conform with requirements of the information provider.

4. The system of claim 1, wherein the processor performs the additional step of executing a transaction for the selected end user with a selected information provider based on the end user data associated with the selected end user and the information provider data associated with the selected information provider.

5. The system of claim 4, wherein the processor automatically performs the transaction execution step according to end user data in the user store.

6. The system of claim 1, wherein the processor performs the additional step of outputting the personal information associated with the selected end user from the personal information store.

7. The system of claim 6, wherein the outputting step performed by the processor outputs the personal information to a delivery platform specified in the end user data associated with the selected end user.

8. The system of claim 7, wherein the specified delivery platform is selected from the group consisting of electronic mail, facsimile, pager, telephone, wireless device, ftp server, Web server, gopher server and Web client.

9. The system of claim 6, wherein the outputting step of the processor outputs the personal information via a world wide web site.

10. The system of claim 9, wherein the outputting step of the processor outputs personal information as a formatted Web page to the world wide web site.

11. The system of claim 9, wherein the outputting step of the processor outputs personal information as formatted Web elements to the world wide web site.

12. The system of claim 9, wherein the outputting step outputs personal information data to the world wide web site.

13. The system of claim 1, wherein the connecting step of the processor performs the following substeps:

(A) accessing the end user data associated with the selected end user;

(B) identifying information providers specified in the accessed end user data; and

(C) establishing a communication link with each of the identified information providers.

14. A method for delivering non-public personal information relating to an end user via a wide-area computer network to an end user from at least one of a plurality of information providers securely storing the personal information under control of a processor located remotely from the information providers and the end user, the method comprising the steps of:

(a) the processor connecting with at least one information provider;

(b) for a selected end user, the processor retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers, the end user data including information identifying the plurality of information providers securely storing the personal information relating to the end user, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information; and

(c) the processor storing the retrieved personal information in a personal information store for access by the selected end user.

15. The method of claim 14, further comprising the step of monitoring information providers for changes.

16. The method of claim 14, further comprising the step of updating the provider store to conform with requirements of the information provider.

17. The method of claim 14, further comprising the step of executing a transaction for the selected end user with a selected information provider based on the accessed end user and the accessed information provider data associated with the selected information provider.

18. The method of claim 17, wherein the execution step is triggered according to the accessed end user data.

19. The method of claim 14, further comprising the step of outputting the personal information associated with the selected end user from the personal information store.

20. The method of claim 19, wherein the outputting step outputs the personal information to a delivery platform specified in the accessed end user data.

21. The method of claim 20, wherein the specified delivery platform is selected from the group consisting of electronic mail, facsimile, pager, telephone, wireless device, ftp server, Web server, gopher server and Web client.

22. The method of claim 19, wherein the outputting step outputs the personal information via a world wide web site.

23. The method of claim 22, wherein the outputting step outputs personal information as a formatted Web page to the world wide web site.

24. The method of claim 22, wherein the outputting step outputs personal information as formatted Web elements to the world wide web site.

25. The method of claim 22, wherein the outputting step outputs personal information data to the world wide web site.

26. The method of claim 14, wherein the connecting step comprises the substeps of:

(i) accessing the end user data associated with the selected end user;

(ii) identifying information providers specified in the accessed end user data; and

(iii) establishing a communication link with each of the identified information providers.

18
~~27.~~ A computer-readable, digital storage device storing executable instructions which cause a processor to deliver non-public personal information relating to an end user from at least one of a plurality of information providers securely storing the personal information to the end user via a wide-area computer network by performing the steps comprising of:

(a) connecting with at least one information provider;

(b) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers, the end user data including information identifying the plurality of information providers securely storing the personal information relating to the end user, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information; and

(c) storing the retrieved personal information in a personal information store.

28. The storage device of claim 27, further storing executable instructions to perform the connecting step by performing substeps comprising of:

(i) accessing the end user data associated with the selected end user;

(ii) identifying information providers specified in the accessed end user data; and

(iii) establishing a communication link with each of the identified information providers.

33 20
~~29~~. The system of claim ~~1~~, further including an intermediary web site having an associated user interface format, wherein the processor performs the additional step of outputting the retrieved personal information to the intermediary web site.

34 33
~~30~~. The system of claim ~~29~~, wherein the retrieved personal information is output by the processor to the intermediary web site in a format other than the format associated with the intermediary web site.

35 33
~~31~~. The system of claim ~~29~~, further including a web client, wherein the intermediary web site outputs the retrieved personal information to the web client, and the web client displays the retrieved personal information.

36 35
~~32~~. The system of claim ~~31~~, wherein the web client displays the retrieved personal information in the format associated with the intermediary web site.

14 1
~~33~~. The method of claim ~~14~~, further comprising the step of outputting the retrieved personal information to an intermediary web site, wherein the intermediary web site has an associated user interface format.

15 14
~~34~~. The method of claim ~~33~~, wherein the retrieved personal information is output to the intermediary web site in a format other than the format associated with the intermediary web site.

16 14
~~35~~. The method of claim ~~33~~, wherein the intermediary web site outputs the retrieved personal information to a web client, and the web client displays the retrieved personal information.

17 16
~~36~~. The method of claim ~~35~~, wherein the web client displays the retrieved personal information in

4

the format associated with the intermediary web site.

VERSION OF CLAIMS WITH MARKINGS TO SHOW CHANGES MADE:

Please amend claims 1, 14 and 27 as follows:

1. (Once amended) A system for delivering non-public personal information relating to an end user via a computer network from at least one of a plurality of information providers securely storing the personal information to [at least one] the end user, the system comprising:
   (a) a user store for storing end user data associated with each end user, the user store including information identifying, for each end user, the plurality of information providers securely storing the personal information relating to the end user;
   (b) a provider store for storing information provider data associated with each information provider, the information provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information;
   (c) a personal information store for storing personal information associated with each end user retrieved from the information providers;
   (d) a processor in communication with the user store, the provider store and the personal information store, for performing the steps of:
      (i) connecting with at least one information provider;
      (ii) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers; and
      (iii) storing the retrieved personal information in the personal information store for access by the selected end user.

14. (Once amended) A method for delivering non-public personal information relating to an end user via a computer network to [at least one] an end user from at least one of a plurality of

information providers securely storing the personal information, the method comprising the steps of:

(a) the processor connecting with at least one information provider;

(b) for a selected end user, the processor retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers, the end user data including information identifying the plurality of information providers securely storing the personal information relating to the end user, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information; and

(c) the processor storing the retrieved personal information in a personal information store for access by the selected end user.

27. (Once amended) A computer-readable, digital storage device storing executable instructions which cause a processor to deliver non-public personal information relating to an end user from at least one of a plurality of information providers securely storing the personal information to the end user via a computer network by performing the steps comprising of:

(a) connecting with at least one information provider;

(b) for a selected end user, retrieving personal information for the selected end user from the connected at least one information provider based on end user data associated with the selected end user and information provider data associated with the connected one or more information providers, the end user data including information identifying the plurality of information providers securely storing the personal information relating to the end user, the provider data including a protocol for instructing the processor how to access the securely stored personal information via the network, the information

accessible to the processor using the protocol also being accessible by the end user via the network independently of the system for delivering personal information; and

(c) storing the retrieved personal information in a personal information store.

Please add the following new claims:

--29. The system of claim 1, further including an intermediary web site having an associated user interface format, wherein the processor performs the additional step of outputting the retrieved personal information to the intermediary web site.--

--30. The system of claim 29, wherein the retrieved personal information is output by the processor to the intermediary web site in a format other than the format associated with the intermediary web site.--

--31. The system of claim 29, further including a web client, wherein the intermediary web site outputs the retrieved personal information to the web client, and the web client displays the retrieved personal information.--

--32. The system of claim 31, wherein the web client displays the retrieved personal information in the format associated with the intermediary web site.--

--33. The method of claim 14, further comprising the step of outputting the retrieved personal information to an intermediary web site, wherein the intermediary web site has an associated user interface format.--

--34. The method of claim 33, wherein the retrieved personal information is output to the intermediary web site in a format other than the format associated with the intermediary web site.--

--35. The method of claim 33, wherein the intermediary web site outputs the retrieved personal

information to a web client, and the web client displays the retrieved personal information.--

--36. The method of claim 35, wherein the web client displays the retrieved personal information in the format associated with the intermediary web site.--

REMARKS

Claims 1, 14 and 27 have been amended. New claims 29-36 have been added. Applicants respectfully request further examination and allowance of the application, as amended.

The Examiner provisionally rejects claims 1-28 under the doctrine of obviousness-type double-patenting as unpatentable over claims 1-9 of co-pending application Serial No. 09/427,602. Without agreeing with or traversing the assertion that claims 1-28 are patentably distinct from claims 1-9 of the co-pending application, Applicants presently intend to submit a Terminal Disclaimer to obviate the rejection at such time as the Examiner may make this provisional rejection an actual rejection.

The Examiner rejects claims 1-28 under 35 U.S.C. § 103(a) as being unpatentable over *Experton* (U.S. Patent No. 5,995,965) in view of *Reed et al.* (U.S. Patent No. 5,862,325). Applicants respectfully traverse this rejection but have amended the independent base claims to clarify what is being claimed.

Applicants' invention, as set forth independent claims 1, 14 and 27, relates to retrieving "personal information" from a number of different information providers and aggregating the retrieved information for an end user. For example, in accordance with one embodiment of the invention, an end user can visit a Web site of the type commonly referred to as a "portal" and can customize the portal to retrieve personal information from a number of different information provider Web sites and display it together for the end user in a cohesive format. Personal information is information that is personal to a specific end user; personal information can describe, for example, some aspect of that person's self, property or rights. "Information providers" can thus include, for example, banks, stock brokerages, utility companies, and others with whom an end user has an account, does business or otherwise shares personal information. The essence of personal information is that it is not accessible to the general public, i.e., other end users; rather, each information provider protects personal information relating to a specific end user against access by persons other than that end user or one acting under the authority of that end user. The information providers have Web sites or other electronic means by which end users can access their personal information in the conventional manner, i.e., independently of the invention, such as by logging onto a Web site, entering a user name and password and following any further instructions for retrieving the information. The invention, however, saves the end user the inconvenience of having to log on to such information provider Web sites individually. In such an embodiment of the invention, the system would automatically visit the web sites, log on, and follow whatever other protocol steps may be required to access

and retrieve the personal information.

The above-described invention, which Applicants believe is now more clearly claimed, is far different from systems such as those described in *Experton* and *Reed*. *Experton* describes a medical information retrieval system in which users access information stored in a central repository by using smart cards at remote reading stations. Such information cannot be accessed *independently* of the subject retrieval system. In Applicant's invention, the information providers are those that an end user could alternatively choose to access in a conventional manner, i.e., independently of using the inventive system. For example, using a Web-enabled computer, a user could navigate to an information provider's Web site, log on by entering a user name and password and follow links to retrieve his or her personal information. "Information providers" do not include those whose Web sites do not store "personal information" or whose Web sites fail to protect such information against unauthorized access. Neither *Experton* nor *Reed* addresses the issue of making access to multiple ones of such personal information providers more convenient by obviating a user contacting each provider individually.

Furthermore, what the Examiner contends is a "user store" in *Experton* does not store information *identifying the information providers* that have personal information relating to a specific end user. Also, what the Examiner contends is a "provider store" does not store information that includes *a protocol for instructing the system how to access the securely stored personal information via the network.* In Applicant's invention, the information providers' computers are accessed in either the same manner as the end user would access them conventionally or in some manner that produces an equivalent result. In other words, for example, in some embodiments of the invention the provider store can store information that allows the processor to automatically emulate the otherwise-manual process of logging on to a Web site and navigating through links until the personal information pertaining to a specified end user is located and retrieved.

Nothing in either *Experton* or *Reed* teaches or suggests the invention as set forth in Applicant's claims. Combining the teachings of these references *could not* produce Applicant's invention because there are limitations recited in the claims that are not taught or suggested in either reference. Therefore, reconsideration and withdrawal of this rejection of claims 1-28 is respectfully requested. Claims 2-13 are believed allowable for at least the same reasons discussed above because they depend from claim 1. Claims 15-26 are believed allowable for at least the same reasons discussed above because they depend from claim 14. Claim 28 is believed allowable for at least the same reasons discussed above with regard to claim 27

because it depends from claim 27. New claims 29-36 are believed allowable for at least the same reasons.

Claims 1-36 remain pending in the application. In view of the foregoing, it is believed all claims are now in condition for allowance. Applicant therefore respectfully requests further examination and allowance of the application.

Respectfully submitted,

NEEDLE & ROSENBERG, P.C.

Gregory J. Kirsch
Registration No. 35,572

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811
404/688-0770

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on the date indicated below.

Gregory J. Kirsch — Date: 2 APRIL 2001

2755

ATTORNEY DOCKET NO. 22022.0003
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)
)
Freishtat *et al.*)
) Group Art Unit: 2755
Serial No. 09/428,511)
) Examiner: Coulter, K.
Filed: October 27, 1999)
)
For: **"APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA"**)

REQUEST FOR EXTENSION OF TIME

BOX AMENDMENT
Assistant Commissioner for Patents
Washington, D.C. 20231

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

04/06/2001 WKORDMA 00000045 09428511
01 FC:117 890.00 OP

April 2, 2001

Sir:

It is respectfully requested that an extension of time for the period indicated below be granted in accordance with the provisions of 37 C.F.R. Section 1.136 to take action required in the application identified in the caption, as reflected by the papers submitted herewith:

_____	One Month	$110.00	($ 55.00)*
_____	Two Months	$390.00	($195.00)*
___X___	Three Months	$890.00	($445.00)*
_____	Four Months	$1,390.00	($695.00)*

H:\APPS\SS\DOCS\ldm\W092818.WPD

_____	Five Months	$1,890.00	($945.00)*

* Small Entity

A check in the amount of $890.00 is attached. This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

NEEDLE & ROSENBERG, P.C.

Gregory J. Kirsch
Registration No. 35,572

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811
(404) 688-0770

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on the date indicated below.

Gregory J. Kirsch — 2 APRIL 2001 — Date

H:\APPS\SS\DOCS\ldm\W092818.WPD

Transaction History Date 2001-06-18
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/428,511	10/27/99	PRUSHIM	B.

TM31/0618

NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

EXAMINER	

ART UNIT	PAPER NUMBER
2182	13

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev 11/00)

1- File Copy

Notice of Allowability

Application No.	Applicant(s)
09/428,511	Freishtat et al.
Examiner	**Art Unit**
Kenneth R. Coulter	2154

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment A (4/5/2001; paper #12)*

2. ☒ The allowed claim(s) is/are *1-36*

3. ☐ The drawings filed on _____ are acceptable as formal drawings.

4. ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

   a) ☐ All b) ☐ Some* c) ☒ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   *Certified copies not received: _____

5. ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION. This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).**

6. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

7. ☒ Applicant MUST submit NEW FORMAL DRAWINGS

   (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

   1) ☐ hereto or 2) ☒ to Paper No. *10* .

   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the examiner.

   (c) ☐ including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8. ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

1 ☒ Notice of References Cited (PTO-892)
2 ☐ Notice of Informal Patent Application (PTO-152)
3 ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
4 ☐ Interview Summary (PTO-413), Paper No. _____ .
5 ☐ Information Disclosure Statement(s) (PTO-1449), Paper No(s). _____
6 ☐ Examiner's Amendment/Comment
7 ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
8 ☒ Examiner's Statement of Reasons for Allowance
9 ☐ Other

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

The prior art of record does not specifically disclose or remotely suggest an **end user data** including **identifying the plurality of information providers** securely storing the personal information relating to the end user, the provider data including a **protocol for instructing the processor how to access** the securely stored personal information.

In addition, Examiner points to Applicant's arguments (Amendment A; paper #12; 4/5/2001; pp. 13 - 15).

A review of claims 1 - 36, in view of the Examiner's arguments above, indicates that claims 1 - 36 are allowable over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth Coulter whose telephone number is (703) 305-8447.

KENNETH R. COULTER
PRIMARY EXAMINER

krc

June 18, 2001

Notice of References Cited

Applicant/Patent	Application/Control No.	
Freishtat et al.	09/428,511	
Examiner	Art Unit	Page 1 of 1
Kenneth R. Coulter	2154	

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY[1]	Name	Classification[2]	
X	A	5,987,440	11/1999	O'Neil et al.	705	44
X	B	5,999,975	12/1999	Kittaka et al.	709	224
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY[1]	Country	Name	Classification[2]	
	N						
	O						
	P						
	Q						
	R						
	S						
	T						

NON-PATENT DOCUMENTS

*		Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages
	U	
	V	
	W	
	X	

* A copy of this reference is not being furnished with this Office action. See MPEP § 707.05(a)

[1] Dates in MM-YYYY format are publication dates.

[2] Classifications may be U.S. or foreign

Transaction History Date 2001-06-18
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

[illegible]

NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/428,511	10/27/99	016	[illegible]	[illegible]
First Named Applicant	FREISHTAT,	[illegible]		

TITLE OF INVENTION APPARATUS AND METHODS FOR AUTOMATED [illegible] AND DELIVERY OF [illegible] TRANSACTIONS INVOLVING ELECTRONIC [illegible] INFORMATION OR DATA

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0 22022.0003	709-218.000	702	[illegible]	NO	$1240.00	[illegible]

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV. 10-96) Approved for use through 06/30/99. (0651-0033)

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Transaction History Date 2001-09-19
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

5C

PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form together with applicable fees, to: Box ISSUE FEE
Assistant Commissioner for Patents
Washington, D.C. 20231

09-19-01

PS

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

Lawrence D. Maxwell (Reg. 35.276) (Depositor's name)

(Signature)

(Date)

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

TM31/0618
NEEDLE & ROSENBERG P C
SUITE 1200 THE CANDLER BUILDING
127 PEACHTREE STREET N W
ATLANTA GA 30303-1811

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/428,511	10/27/99	036	COULTER, K 2154	06/18/01

First Named Applicant	35 USC 154(b) term ext. =	0 Days.
FREISHTAT.		

TITLE OF INVENTION: APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
22022.0003	709-218.000	Z99	UTILITY	NO	$1240.00	09/18/01

1. Change of Correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.
- ☒ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☒ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Needle & Rosenberg, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.
(A) NAME OF ASSIGNEE: Verticalone Corporation
(B) RESIDENCE: (CITY & STATE OR COUNTRY) Two Concourse Parkway Suite 700, Atlanta Georgia 30328
Please check the appropriate assignee category indicated below (will not be printed on the patent)
☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):
- ☒ Issue Fee
- ☒ Advance Order - # of Copies 10

4b. The following fees or deficiency in these fees should be charged to:
DEPOSIT ACCOUNT NUMBER 14-0629
(ENCLOSE AN EXTRA COPY OF THIS FORM)
- ☒ Issue Fee
- ☒ Advance Order - # of Copies

The COMMISSIONER OF PATENTS AND TRADEMARKS is requested to apply the Issue Fee to the application identified above.

(Authorized Signature) [signature] (Date) 9-18-01

NOTE: The Issue Fee will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

09/20/2001 MBERHE1 00000007 09428511
01 FC:142 1240.00 OP
02 FC:561 30.00 OP

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMIT THIS FORM WITH FEE

DOCKET NUMBER 22022.0003
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	
	)	
Frieshtat, *et al.*	)	Group Art No.: 2154
	)	
Serial No.: 09/428,511	)	
	)	Examiner: Coulter, K.
Filed: October 27, 1999	)	
	)	
For: **APPARATUS AND METHODS FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA**	)	

SUBMISSION OF FORMAL DRAWINGS

BOX ISSUE FEE
Assistant Commissioner for Patents
Washington, D.C. 20231
ATTENTION: OFFICIAL DRAFTSPERSON

NEEDLE & ROSENBERG, P.C.
Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811

September 18, 2001

Sir:

Pursuant to Paper No. 10 issued October 3, 2000, a copy of which is enclosed, submitted herewith are Figures 1-11 prepared as formal drawings as required for the above-identified patent application.

Although no fees are believed due for this submission, the Commissioner is hereby authorized to charge any fee which may be required, or credit any overpayment, to Deposit Account No. 14-0629.

Respectfully submitted,

Lawrence D. Maxwell
Registration No. 35,276

Suite 1200, The Candler Building
127 Peachtree Street, N.E.
Atlanta, Georgia 30303-1811
(404) 688-0770

CERTIFICATE OF EXPRESS MAILING UNDER 37 C.F.R. § 1.10

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail, No.EL924048603US in an envelope addressed to: BOX ISSUE FEE, Assistant Commissioner for Patents, Washington, D.C. 20231, on the date noted below.

Everardo McFarlane — Date: 9-18-01

BEST COPY

Form PTO 948 (Rev. 8-98) U.S. DEPARTMENT OF COMMERCE Patent and Trademark Office Application No. 09/428,241

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 10/27/99 are:

A. ☐ approved by the Draftsperson under 37 CFR 1.84 or 1.152.

B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be sumitted according to the instructions on the back of this notice.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings:
Black ink. Color.
___ Color drawings are not acceptable until petiton is granted. Fig(s) ___
___ Pencil and non black ink not permitted. Fig(s) ___
2. PHOTOGRAPHS. 37 CFR 1.84 (b)
___ 1 full-tone set is required. Fig(s) ___
___ Photographs not properly mounted (must use brystol board or photographic double-weight paper). Fig(s) ___
___ Poor quality (half-tone). Fig(s) ___
3. TYPE OF PAPER. 37 CFR 1.84(e)
___ Paper not flexible, strong, white, and durable. Fig(s) ___
___ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) ___
___ Mylar, velum paper is not acceptable (too thin). Fig(s) ___
4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:
___ 21.0 cm by 29.7 cm (DIN size A4)
___ 21.6 cm by 27.9 cm (8 1/2 x 11 inches)
___ All drawing sheets not the same size. Sheet(s) ___
___ Drawings sheets not an acceptable size. Fig(s) ___
5. MARGINS. 37 CFR 1.84(g): Acceptable margins:
Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm
SIZE: A4 Size
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
SIZE: 8 1/2 x 11
Margins not acceptable. Fig(s) ___
___ Top (T) ___ Left (L)
___ Right (R) ___ Bottom (B)
6. VIEWS. 37 CFR 1.84(h)
REMINDER: Specification may require revision to correspond to drawing changes.
Partial views. 37 CFR 1.84(h)(2)
___ Brackets needed to show figure as one entity. Fig(s) ___
___ Views not labeled separately or properly. Fig(s) ___
___ Enlarged view not labeled separetely or properly. Fig(s) ___
7. SECTIONAL VIEWS. 37 CFR 1.84 (h)(3)
___ Hatching not indicated for sectional portions of an object. Fig(s) ___
___ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) ___
8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
___ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) ___
9. SCALE. 37 CFR 1.84(k)
___ Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) ___
10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(i)
___ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) ___
11. SHADING. 37 CFR 1.84(m)
___ Solid black areas pale. Fig(s) ___
___ Solid black shading not permitted. Fig(s) ___
___ Shade lines, pale, rough and blurred. Fig(s) ___
12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)
___ Numbers and reference characters not plain and legible. Fig(s) ___
___ Figure legends are poor. Fig(s) ___
___ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) ___
___ English alphabet not used. 37 CFR 1.84(p)(2) Figs ___
☒ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) 1-4+5, 8-11
13. LEAD LINES. 37 CFR 1.84(q)
___ Lead lines cross each other. Fig(s) ___
___ Lead lines missing. Fig(s) ___
14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)
___ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) ___
15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
___ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) ___
16. CORRECTIONS. 37 CFR 1.84(w)
___ Corrections not made from prior PTO-948 dated ___
17. DESIGN DRAWINGS. 37 CFR 1.152
___ Surface shading shown not appropriate. Fig(s) ___
___ Solid black shading not used for color contrast. Fig(s) ___

COMMENTS

REVIEWER Q.D DATE 9/11/00 TELEPHONE NO. ___

ATTACHMENT TO PAPER NO. 10

Figure 1
(Prior Art)

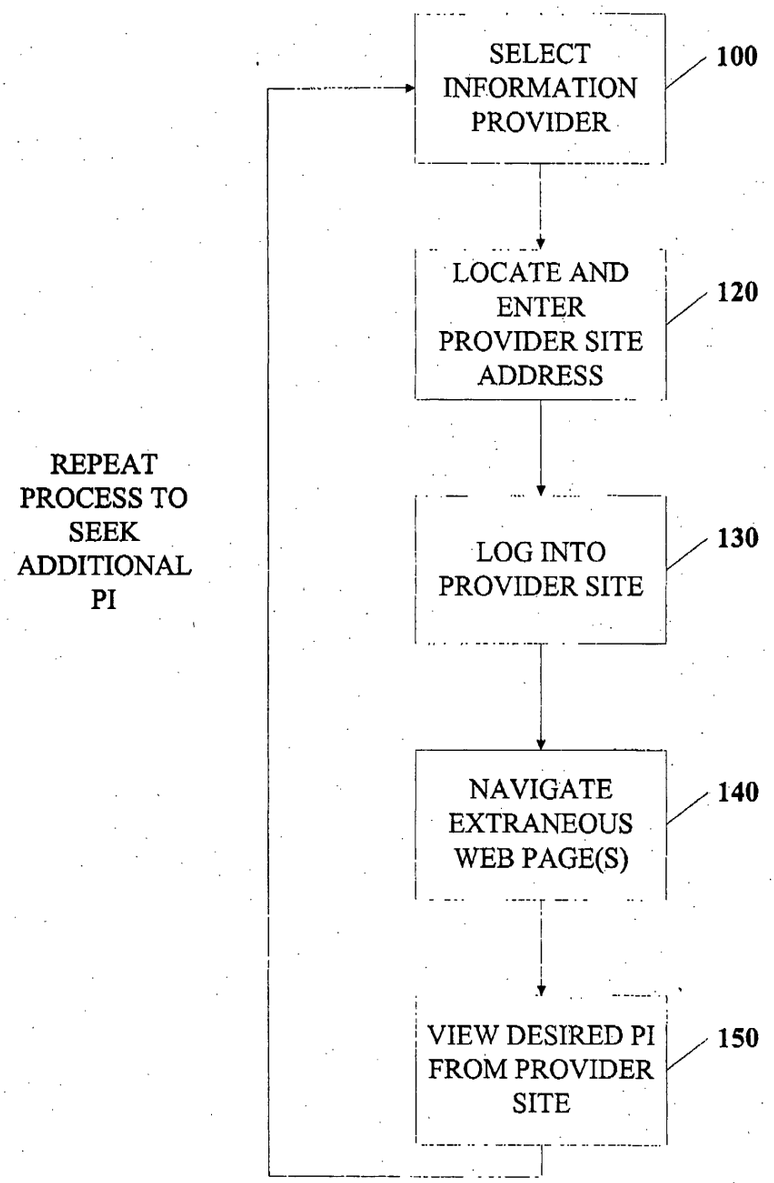


Figure 2

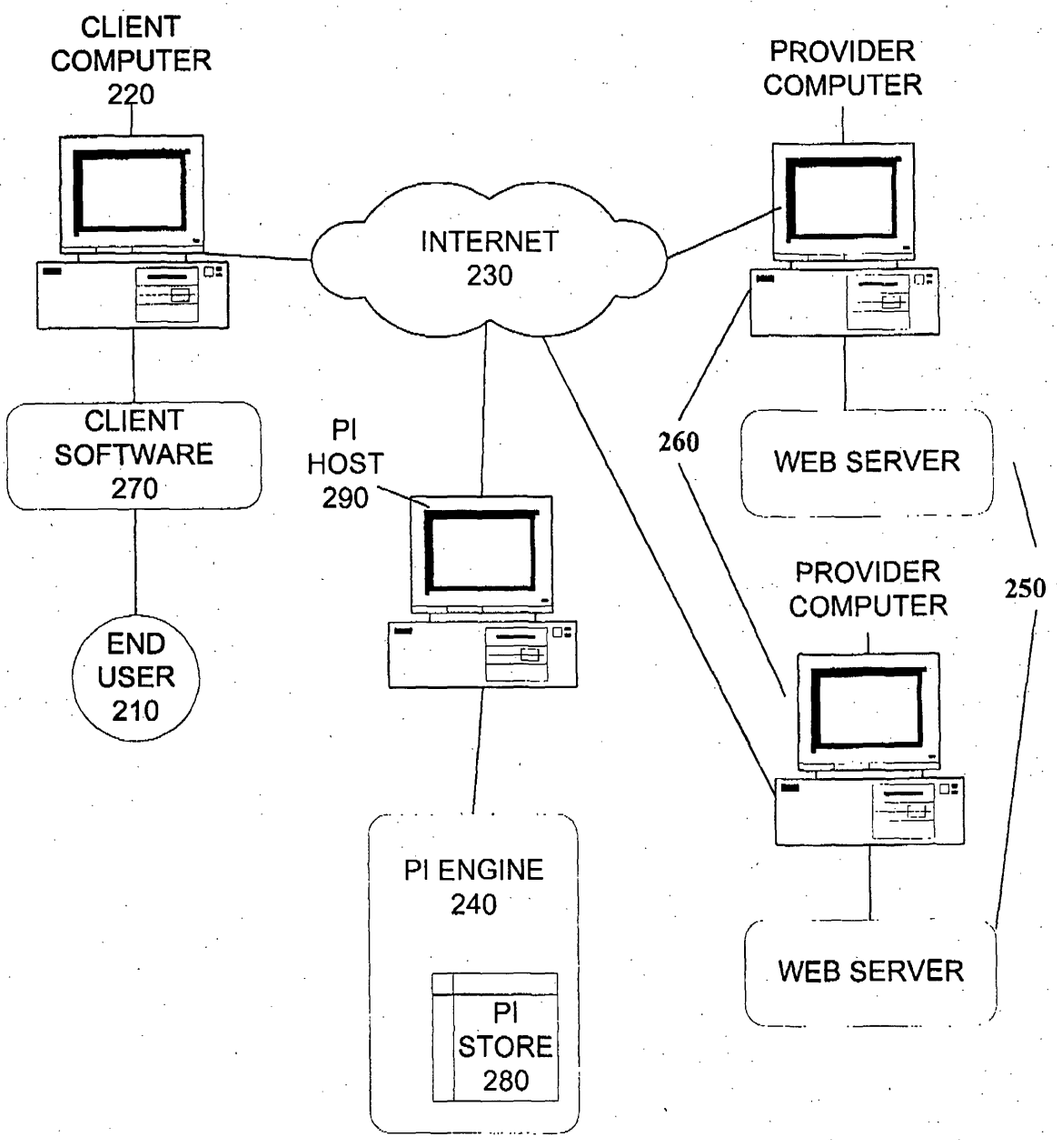

CLIENT COMPUTER 220
PROVIDER COMPUTER
INTERNET 230
CLIENT SOFTWARE 270
PI HOST 290
260
WEB SERVER
PROVIDER COMPUTER
250
END USER 210
PI ENGINE 240
PI STORE 280
WEB SERVER

Figure 3
240

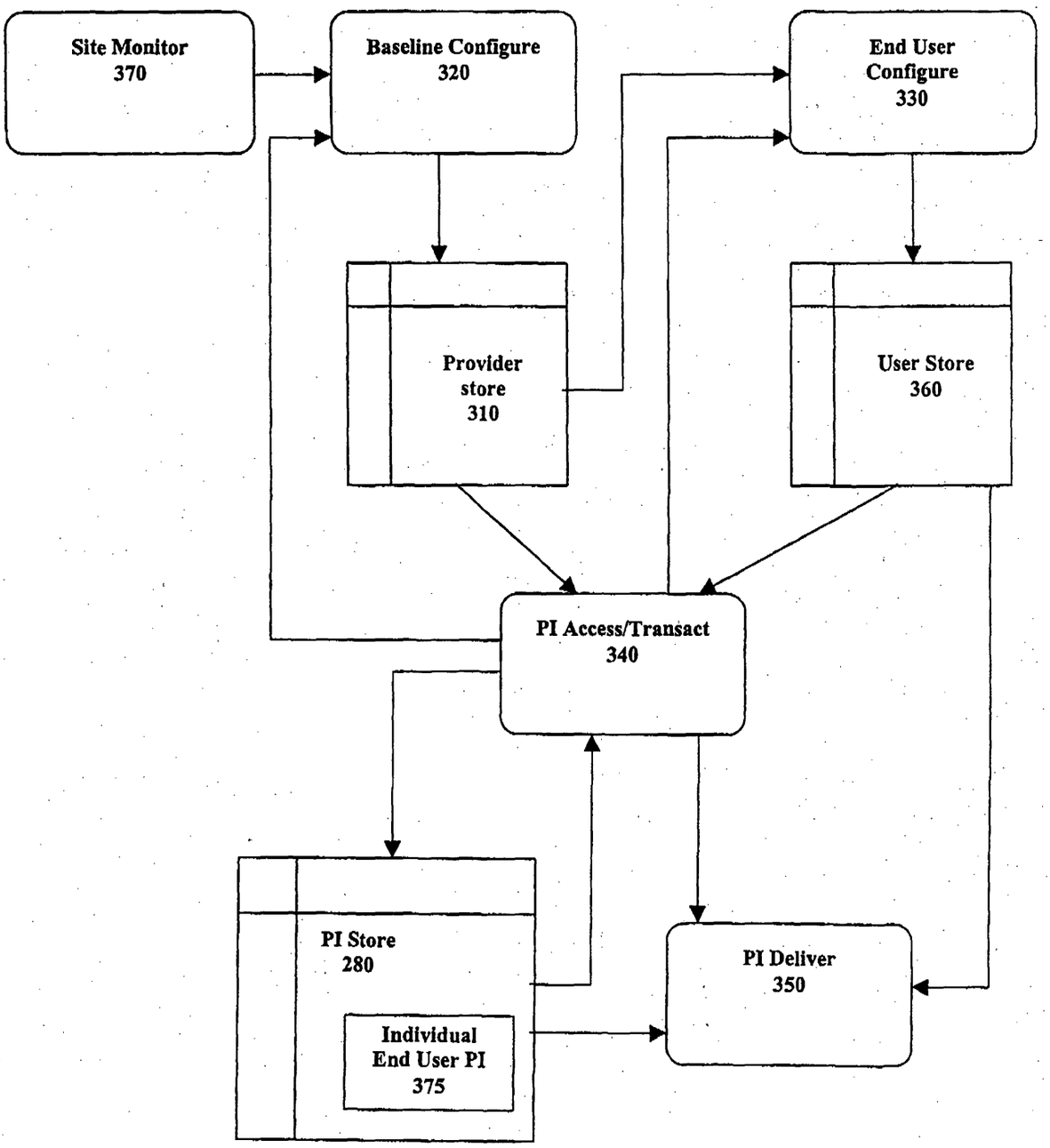
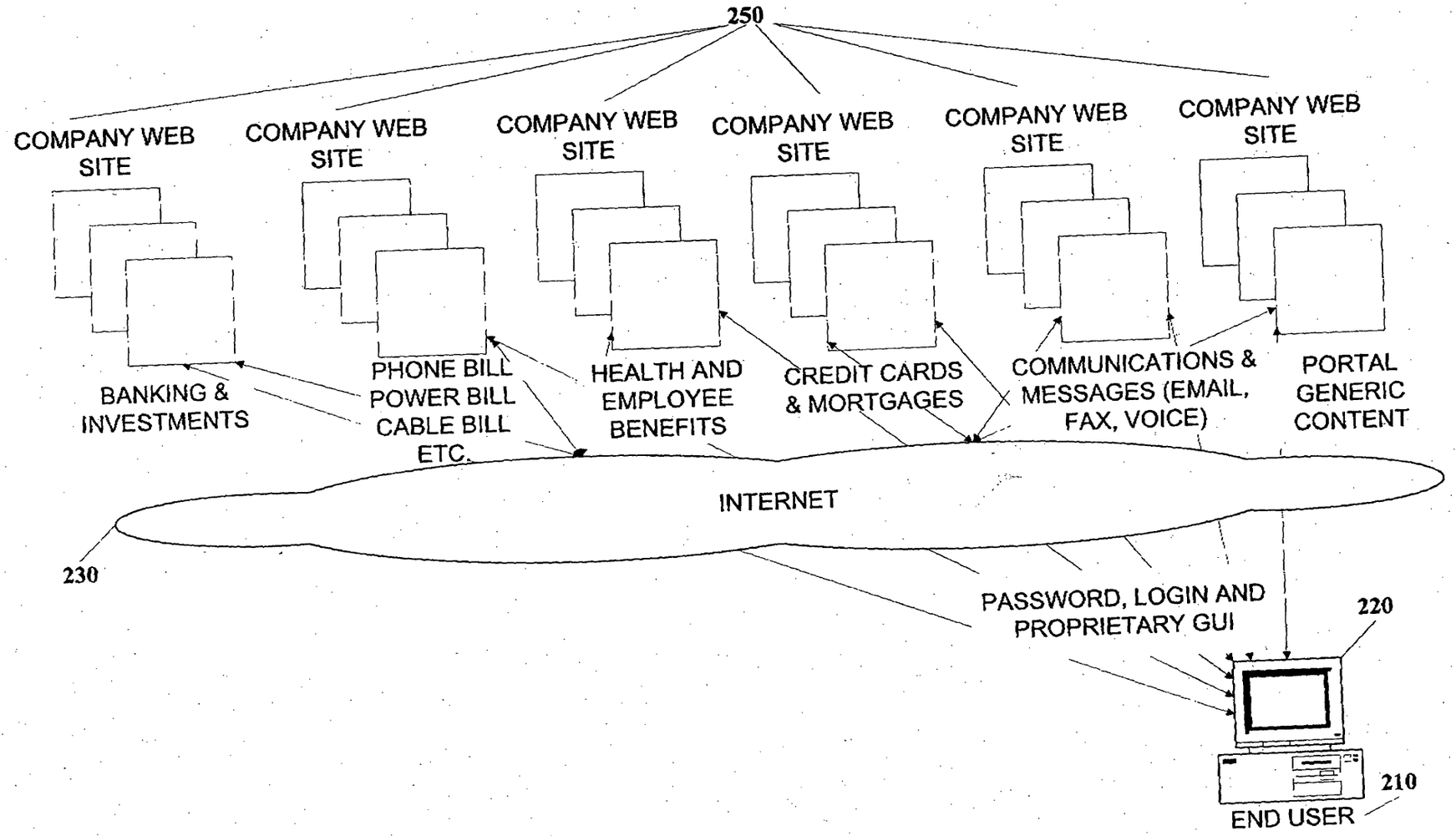
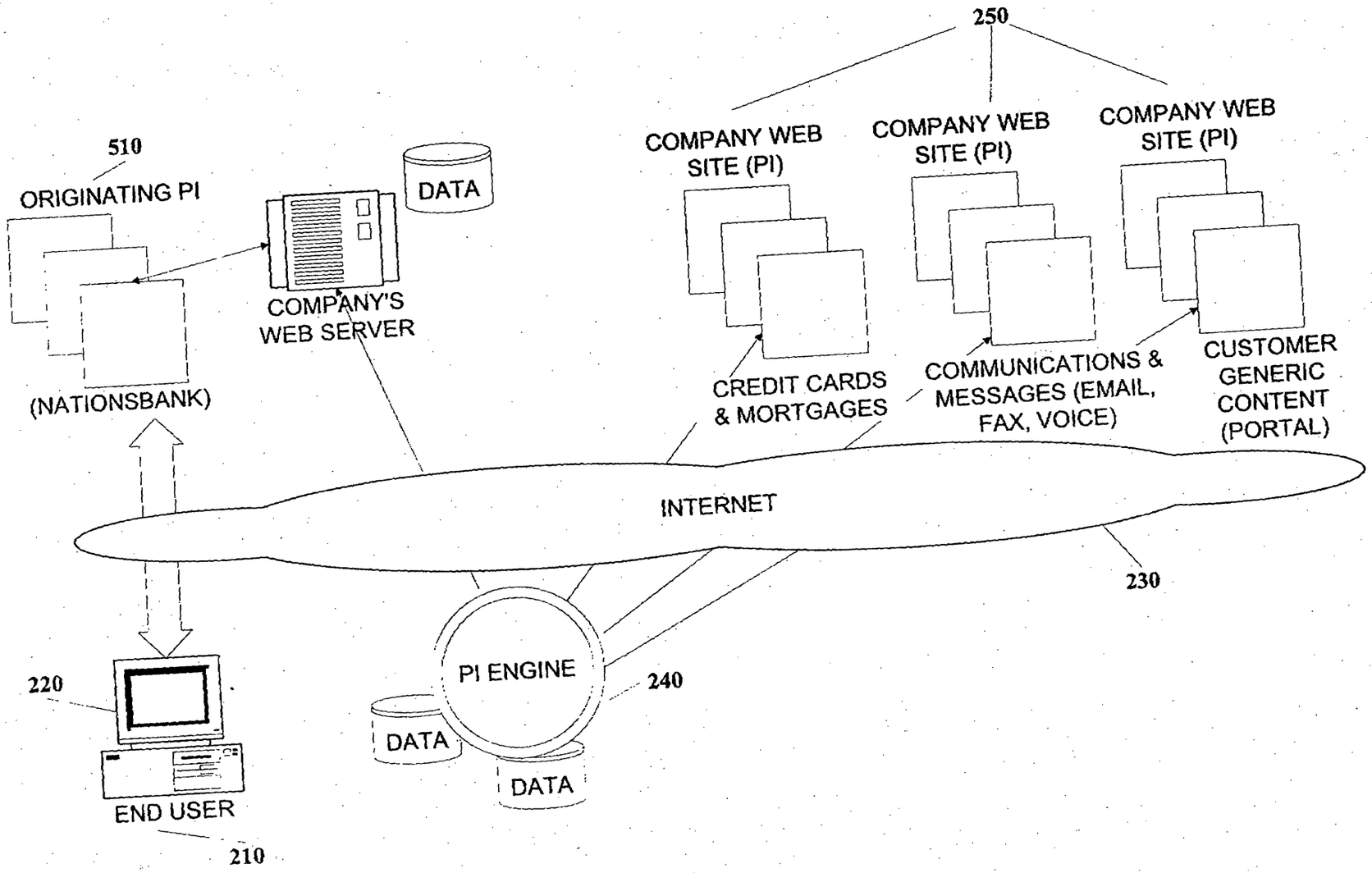

Site Monitor
370
Baseline Configure
320
End User
Configure
330
Provider
store
310
User Store
360
PI Access/Transact
340
PI Store
280
Individual
End User PI
375
PI Deliver
350

Figure 4
(Prior Art)



Inventor: Freishtat, *et al.*
Title: "Apparatus and Methods for Automated Aggregation and Delivery of and Transactions Involving Electronic Personal Informa' or Data"
Serial No.: 09/428,511
Dc. ..t No.: 22022.0003
Contact: Lawrence D. Maxwell, Esq. (404) 688-0770
Filing Date: October . , 999
Sheet 4 of 11

Figure 5



Inventor: Freishtat, et al.
Title: "Apparatus and Methods for Automated Aggregation and Delivery of and Transactions Involving Electronic Personal Information Data"
Docket/Ref.: 22022.0003
Contact: Lawrence D. Maxwell, Esq. (404) 668-0770
Serial No.: 09/428,511
Filing Date: October 27, 1999
Sheet 5 of 11

Figure 6

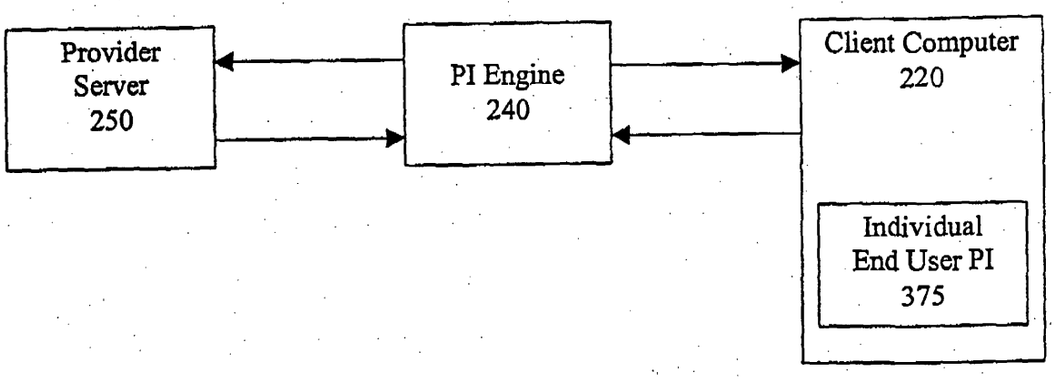

Provider Server 250
PI Engine 240
Client Computer 220
Individual End User PI 375

Figure 7

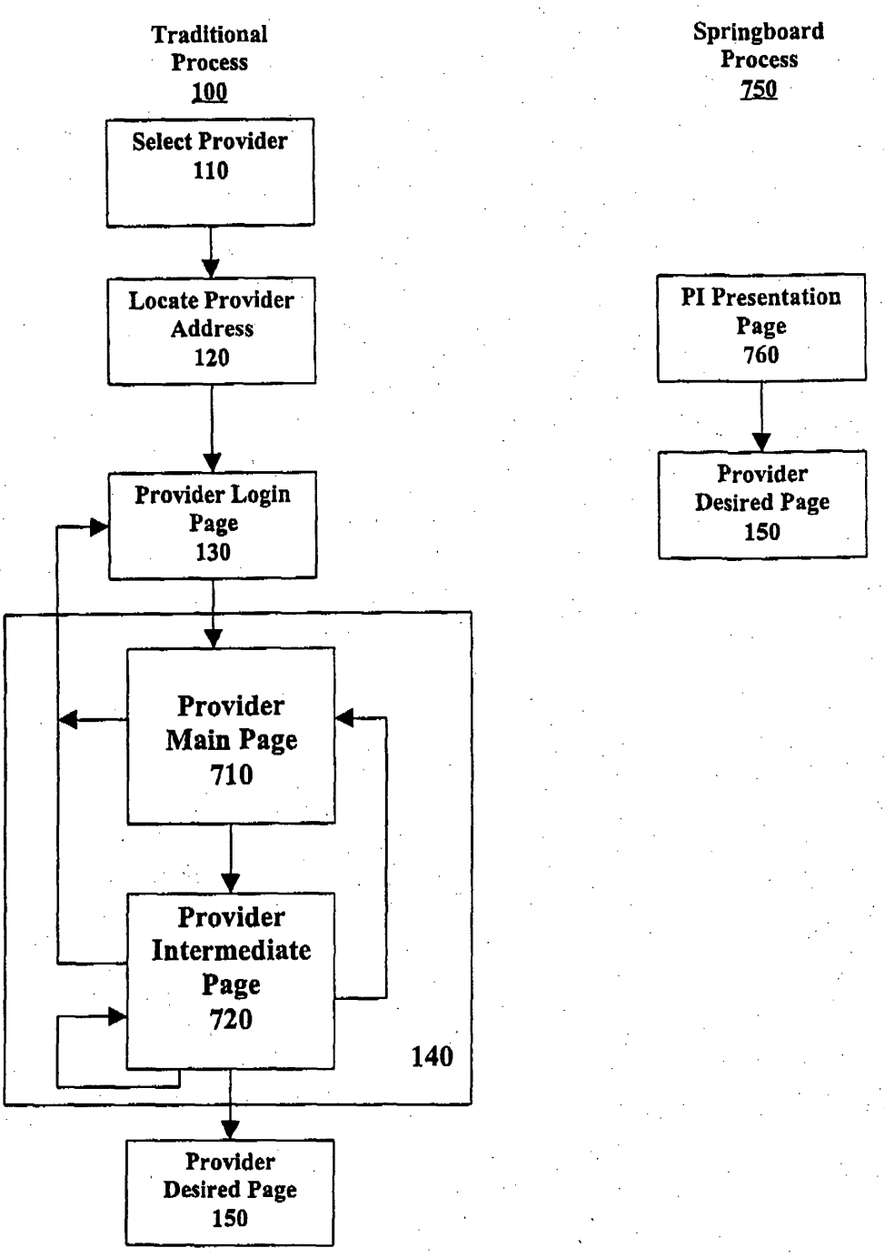

Traditional Process
100
Select Provider
110
Locate Provider Address
120
Provider Login Page
130
Provider Main Page
710
Provider Intermediate Page
720
140
Provider Desired Page
150
Springboard Process
750
PI Presentation Page
760
Provider Desired Page
150

Figure 8

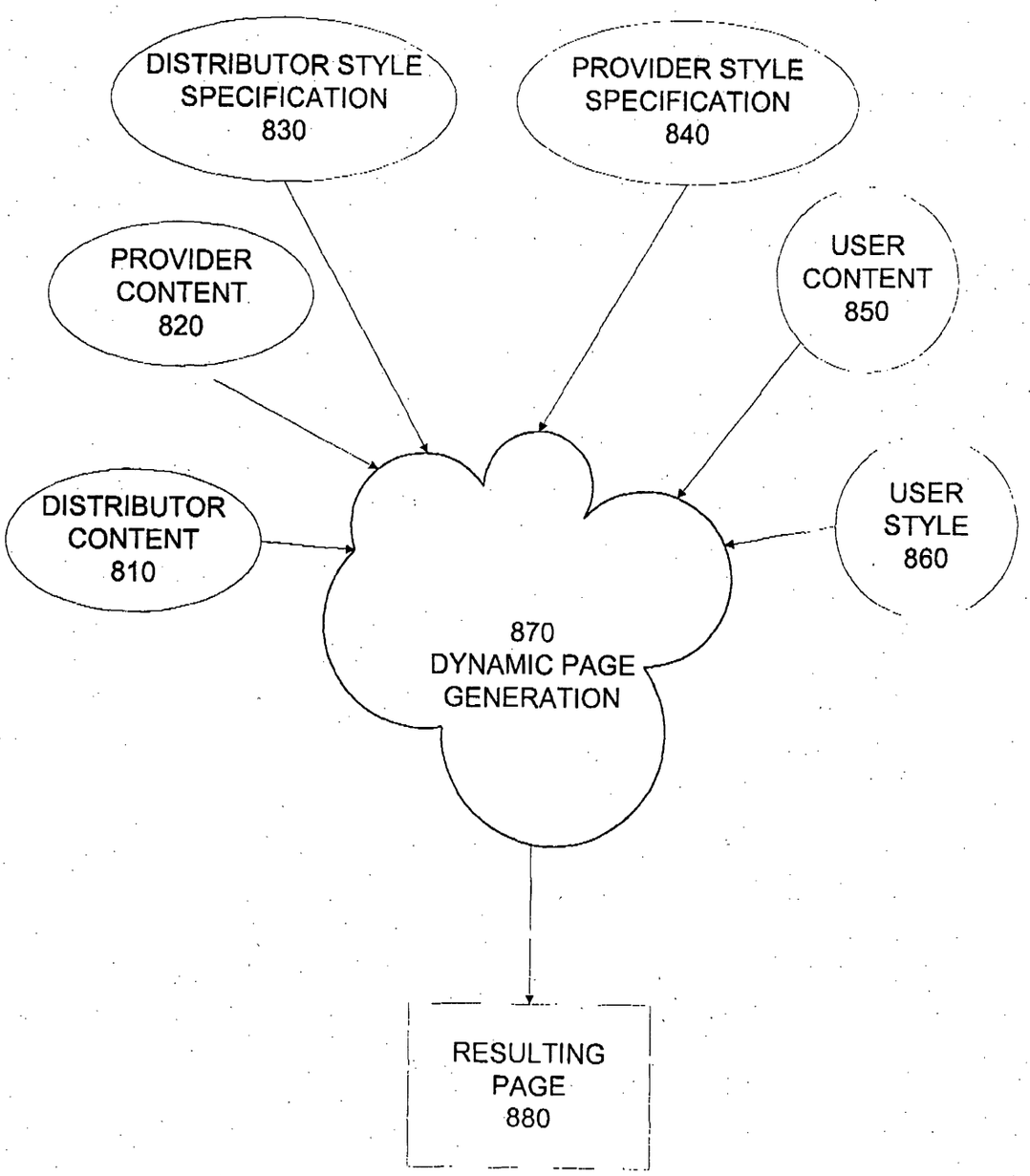

DISTRIBUTOR STYLE SPECIFICATION 830
PROVIDER STYLE SPECIFICATION 840
PROVIDER CONTENT 820
USER CONTENT 850
DISTRIBUTOR CONTENT 810
USER STYLE 860
870 DYNAMIC PAGE GENERATION
RESULTING PAGE 880

Figure 9

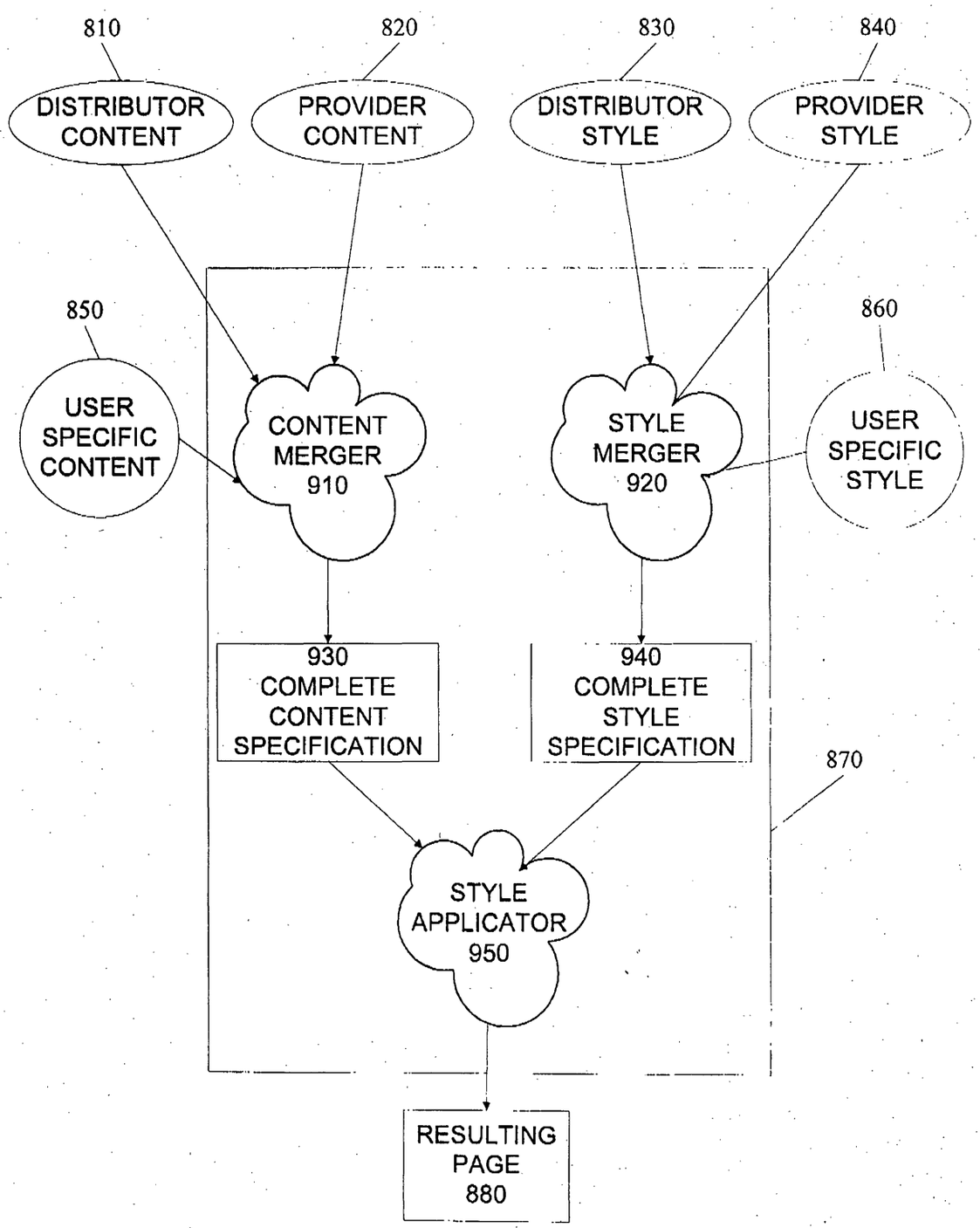
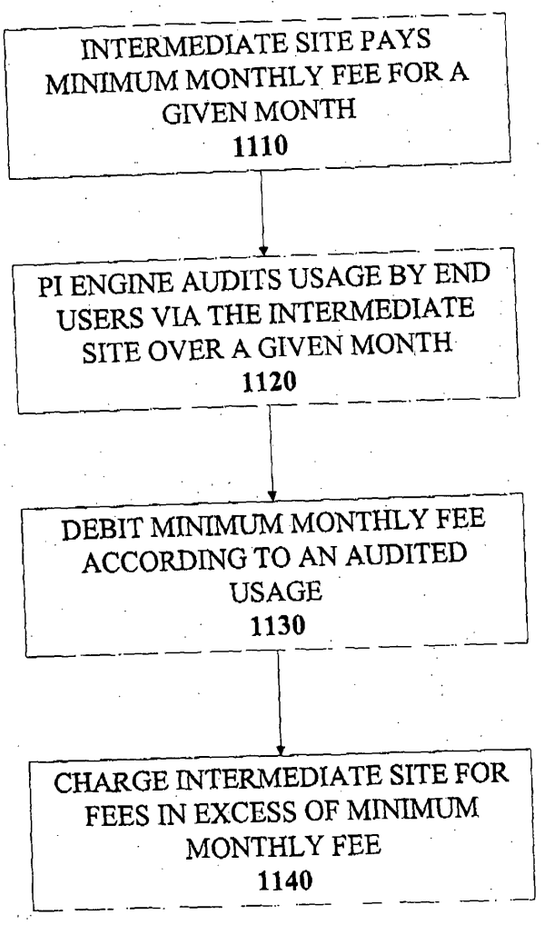

810
DISTRIBUTOR CONTENT
820
PROVIDER CONTENT
830
DISTRIBUTOR STYLE
840
PROVIDER STYLE
850
USER SPECIFIC CONTENT
CONTENT MERGER 910
STYLE MERGER 920
860
USER SPECIFIC STYLE
930 COMPLETE CONTENT SPECIFICATION
940 COMPLETE STYLE SPECIFICATION
870
STYLE APPLICATOR 950
RESULTING PAGE 880

Figure 10

IDENTIFY PROVIDER AND APPLET. 1010
ACCESS APPLET TEMPLATE. 1020
ACCESS DATA FOR APPLET TEMPLATE. 1030
INTERPRET APPLET. 1040
APPLET ENDS 1060
SUPPLY OR RECEIVE DATA. 1050.

Figure 11


INTERMEDIATE SITE PAYS MINIMUM MONTHLY FEE FOR A GIVEN MONTH
1110
PI ENGINE AUDITS USAGE BY END USERS VIA THE INTERMEDIATE SITE OVER A GIVEN MONTH
1120
DEBIT MINIMUM MONTHLY FEE ACCORDING TO AN AUDITED USAGE
1130
CHARGE INTERMEDIATE SITE FOR FEES IN EXCESS OF MINIMUM MONTHLY FEE
1140

PATENT APPLICATION FEE DETERMINATION RECORD
Effective November 10, 1998

Application or Docket Number

CLAIMS AS FILED - PART I

	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
FOR		
BASIC FEE		
TOTAL CLAIMS	84 minus 20=	*
INDEPENDENT CLAIMS	2 minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE [ ]		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
	380.00	OR		760.00
X$ 9=		OR	X$18=	144
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL		OR	TOTAL	904

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 84	Minus	** 28	= 84
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	144
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875
(Rev. 11/98)

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
☆ U.S. GPO:1998-454-473/80301

MPI Family Report (Family Bibliographic and Legal Status)

In the MPI Family report, all publication stages are collapsed into a single record, based on identical application data. The bibliographic information displayed in the collapsed record is taken from the latest publication.

Report Created Date: 2011-06-09

Name of Report:

Number of Families: 1

Comments:

Table of Contents

Family1

35 records in the family, collapsed to 29 records.

AT268484T 20040615

[no drawing available]

(GER) SYSTEM UND VERFAHREN FUER DEN AUTOMATISCHEN ZUGRIFF AUF PERSOENLICHE DATEN

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; BURSON ROBERT US ; ULBERG DIMA US

Application No: AT 00108963 T

Filing Date: 19991027

Issue/Publication Date: 20040615

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20041215	(-)	RER	CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES

AT242511T 20030615

(GER) GERAET UND VERFAHREN FUER DIE AUTOMATISCHE ZUSAMMENSTELLUNG UND UEBERTRAGUNG VON TRANSAKTIONEN WELCHE PERSOENLICHE ELEKTRONISCHE INFORMATIONEN ODER DATEN ENTHALTEN

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: AT 00108964 T

Filing Date: 19991027

Issue/Publication Date: 20030615

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20031215	(-)	RER	CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES

AT273538T 20040815

(GER) GERAET UND VERFAHREN FUER AUTOMATISCHE AGGREGATION UND ABGABE VON ELEKTRONISCHER PERSOENLICHER INFORMATION ODER DATEN

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; PARNAS LEON US ; RAJAN PALANISWAMY US ; BURSON ROBERT US ; KAIB PAUL US ; ULBERG DIMA US

Application No: AT 99971117 T

Filing Date: 19991027

Issue/Publication Date: 20040815

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20050215	(-)	RER	CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES

AU737572C 20040520
AU737572B2 20010823

(ENG) Apparatus and method for automated aggregation and delivery of electronic personal information or data

[no drawing available]

Assignee: VERTICALONE CORP

Inventor(s): FREISHTAT GREGG ; PARNAS LEON ;
RAJAN PALANISWAMY ; BURSON ROBERT ;
KAIB PAUL ; ULBERG DIMA

Application No: AU 1236700 A

Filing Date: 19991027

Issue/Publication Date: 20040520

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20011220	(+)	FGA	LETTERS PATENT SEALED (STANDARD PATENT)
20031030	()	DA2	: THE NATURE OF THE PROPOSED AMENDMENT IS AS SHOWN IN THE STATEMENT(S) FILED 20030919;
20040520	()	DA3	: THE NATURE OF THE AMENDMENT IS AS WAS NOTIFIED IN THE OFFICIAL JOURNAL DATED 20031030;

AU1236700A 20000515

(ENG) Apparatus and method for automated aggregation and delivery of electronic personal information or data

[no drawing available]

Assignee: VERTICALONE CORP

Inventor(s): FREISHTAT GREGG ; PARNAS LEON ; RAJAN PALANISWAMY ; BURSON ROBERT ; KAIB PAUL ; ULBERG DIMA

Application No: AU 1236700 D

Filing Date: 19991027

Issue/Publication Date: 20000515

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20011220	(+)	FGA	LETTERS PATENT SEALED (STANDARD PATENT)
20031030	()	DA2	: THE NATURE OF THE PROPOSED AMENDMENT IS AS SHOWN IN THE STATEMENT(S) FILED 20030919;
20040520	()	DA3	: THE NATURE OF THE AMENDMENT IS AS WAS NOTIFIED IN THE OFFICIAL JOURNAL DATED 20031030;

BR9907075A 20001017

(POR) Sistema processo e dispositivo de armazanamento digital para distribuir informações pessoais de pelo menos um provedor de informação para pelo menos um usuário final, processo, sistema e dispositivo de armazenamento digital para distribuir armazenar e recuperar dados associados com um usuário final agregado de um ou mais provedores de informação, sistema e processo para gerar documentos eletrônicos, processo, sistema e dispositivo de armazenamento digital para planejar e coleta de informações por um computador central, processo, dispositivo de armazenamento digital e sistema para executar automaticamente uma ação para um usuário final, processo, dispositivo de armazenamento digital e sistema para monitorar interações entre um provedor de informações e um usuário final de informações pessoais, e, processo, dispositivo de armazenamento digital e sitema de acesso automatizado para informações pessoais associadas com um usuário final

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG ; PARNAS LEON ; RAJAN PALANISWAMY ; BURSON ROBERT ; KAIB PAUL ; ULBERG DIMA

Application No: BR 9907075 A

Filing Date: 19991027

Issue/Publication Date: 20001017

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20031202	(-)	FA10	DISMISSAL: DISMISSAL - ARTICLE 33 OF INDUSTRIAL PROPERTY LAW
20040700	()	BA1W	

CA2306083A1 20000504

(ENG) APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF ELECTRONIC PERSONAL INFORMATION OR DATA

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): PARNAS LEON US ; FREISHTAT GREGG US ; KAIB PAUL US ; ULBERG DIMA US ; BURSON ROBERT US ; RAJAN PALANISWAMY US

Application No: CA 2306083 A

Filing Date: 19991027

Issue/Publication Date: 20000504

Abstract: (ENG) A system for delivering personal information according to the present invention includes a user store (360) including end user data, a provider store (310) including information provider data, a personal information store (280) including personal information (375) and a processor that communicates with these data stores. The processor selects an end user for personal information aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information (375) is stored in the personal information store (280).

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Publication Language: ENG

Legal Status:

Date	+/-	Code	Description
20000412	(+)	AFNE	NATIONAL PHASE ENTRY
20000721	(+)	EEER	EXAMINATION REQUEST
20020408	(-)	FZDE	DEAD
20030403	(+)	AFNE	NATIONAL PHASE ENTRY Effective date: 20000412;
20030403	(+)	AFNE	NATIONAL PHASE ENTRY Effective date: 20000412;
20030403	(+)	EEER	EXAMINATION REQUEST Effective date: 20000721;
20030403	(+)	EEER	EXAMINATION REQUEST Effective date: 20000721;
20030403	(-)	FZDE	DEAD Effective date: 20020408;
20030403	(-)	FZDE	DEAD Effective date: 20020408;

CA2308242A1 20000504

(ENG) APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF AND TRANSACTIONS INVOLVING ELECTRONIC PERSONAL INFORMATION OR DATA

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): RAJAN PALANISWAMY US ; BURSON ROBERT US ; KAIB PAUL US ; PARNAS LEON US ; ULBERG DIMA US ; FREISHTAT GREGG US

Application No: CA 2308242 A

Filing Date: 19991027

Issue/Publication Date: 20000504

Priority Data: CA 2306083 19991027 A X; US 10591798 19981028 P X; US 13439599 19990517 P X;

IPC (International Class): H04L01216; G06F01740

Publication Language: ENG

Legal Status:

Date	+/-	Code	Description
20000704	(+)	EEER	EXAMINATION REQUEST
20020318	(-)	FZDE	DEAD

CA2308246A1 20000504

(ENG) SYSTEM AND METHOD FOR AUTOMATED ACCESS TO PERSONAL INFORMATION

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): RAJAN PALANISWAMY US ; BURSON ROBERT US ; KAIB PAUL US ; PARNAS LEON US ; ULBERG DIMA US ; FREISHTAT GREGG US

Application No: CA 2308246 A

Filing Date: 19991027

Issue/Publication Date: 20000504

Priority Data: CA 2306083 19991027 A X; US 10591798 19981028 P X; US 13439599 19990517 P X;

IPC (International Class): H04L01216; G06F01740

Publication Language: ENG

Legal Status:

Date	+/-	Code	Description
20000704	(+)	EEER	EXAMINATION REQUEST
20020325	(-)	FZDE	DEAD

CN1420445A 20030528

(ENG) Device and method for automatically collecting and delivering electronic personal information and processing affairs

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FRESTATE G US ; LAYARD P US

Application No: CN 00120240 A

Filing Date: 20000714

Issue/Publication Date: 20030528

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20030528	0	C06	Corresponding country code for PRS Code (EP REG): HK; Corresponding EP Code 1 for PRS Code (EP REG): WD; Corresponding patent document: 1056246; Country code of corresponding patent document: HK;

CN1497465A 20040519

(ENG) System and method for automatic access peraonal information

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): BULLSEN R US ; URBORGER D US ; FRESTAT G US

Application No: CN 00120241 A

Filing Date: 19991027

Issue/Publication Date: 20040519

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20040728	()	C06	Corresponding country code for PRS Code (EP REG): HK; Corresponding EP Code 1 for PRS Code (EP REG): DE; Corresponding patent document: 1066078; Country code of corresponding patent document: HK;
20060517	()	C02	

CN1287640A 20010314

(ENG) Apparatus and method for automated aggregation and delivery of electronic personal information or data

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT G US ; PARNAS L US ; RAJAN P US

Application No: CN 99801737 A

Filing Date: 19991027

Issue/Publication Date: 20010314

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20080702	()	C06	Corresponding country code for PRS Code (EP REG): HK; Corresponding EP Code 1 for PRS Code (EP REG): WD; Corresponding patent document: 1035595; Country code of corresponding patent document: HK;

DE69908610D1 20030710

(GER) Geraet und Verfahren fuer die automatische Zusammenstellung und UEbertragung von Transaktionen welche persoenliche elektronische informationen oder Daten enthalten

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: DE 69908610 A

Filing Date: 19991027

Issue/Publication Date: 20030710

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20040701	(+)	8364	NO OPPOSITION DURING TERM OF OPPOSITION
20040826	(-)	8339	CEASED/NON-PAYMENT OF THE ANNUAL FEE

DE69908610T2 20031211

(GER) Geraet und Verfahren fuer die automatische Zusammenstellung und UEbertragung von Transaktionen welche persoenliche elektronische informationen oder Daten enthalten

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: DE 69908610 T

Filing Date: 19991027

Issue/Publication Date: 20031211

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20040701	(+)	8364	NO OPPOSITION DURING TERM OF OPPOSITION
20040826	(-)	8339	CEASED/NON-PAYMENT OF THE ANNUAL FEE

DE69917766D1 20040708

(GER) System und Verfahren fuer den automatischen Zugriff auf persoenliche Daten

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; BURSON ROBERT US ; ULBERG DIMA US

Application No: DE 69917766 A

Filing Date: 19991027

Issue/Publication Date: 20040708

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20050504	(-)	8332	NO LEGAL EFFECT FOR DE

DE69919411D1 20040916

(GER) GERAET UND VERFAHREN FUER AUTOMATISCHE AGGREGATION UND ABGABE VON ELEKTRONISCHER PERSOENLICHER INFORMATION ODER DATEN

[no drawing available]

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; PARNAS LEON US ; RAJAN PALANISWAMY US ; BURSON ROBERT US ; KAIB PAUL US ; ULBERG DIMA US

Application No: DE 69919411 A

Filing Date: 19991027

Issue/Publication Date: 20040916

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status:

Date	+/-	Code	Description
20050714	(-)	8332	NO LEGAL EFFECT FOR DE

EP1069514B1 20040602
EP1069514A3 20011114
EP1069514A2 20010117

(ENG) System and method for automated access to personal information

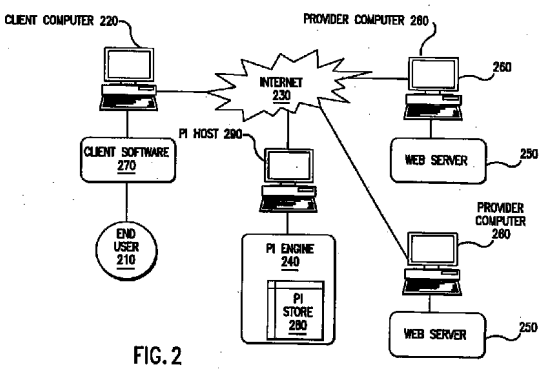


FIG. 2

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; BURSON ROBERT US ; ULBERG DIMA US

Application No: EP 00108963 A

Filing Date: 19991027

Issue/Publication Date: 20040602

Abstract: (ENG) A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor selects an end user for personal information aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

Priority Data: EP 99971117 19991027 A 3; US 10591798 19981028 P; US 13439599 19990517 P;

Related Application(s): 99971117.9 19991027 1198765 EP

IPC (International Class): G06F01730

ECLA (European Class): G06F02100N9A2P; G06F02100N9A2P2; G06F02100N9A2R

Designated Countries:
----Designated States: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Publication Language: ENG

Filing Language: ENG

Agent(s): Gruenecker, Kinkeldey, Stockmair & Schwanhaeusser, Anwaltssozietaet Maximilianstrasse 58, 80538 Muenchen, DE DE

Legal Status:

Date	+/-	Code	Description
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): AT; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): BE; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;

20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CY; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FI; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FR; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): IT; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LI; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): NL; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040602;
20040602	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): GB; Corresponding EP Code 1 for PRS Code (EP REG): FG4D;
20040615	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): CH; Corresponding EP Code 1 for PRS Code (EP REG): EP;

20040708	( )	REF	CORRESPONDS TO: Corresponding patent document: 69917766; Country code of corresponding patent document: DE; Publication date of corresponding patent document: 20040708; Kind code of corresponding patent document: P;
20040728	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): IE; Corresponding EP Code 1 for PRS Code (EP REG): FG4D;
20040902	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): DK; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040902;
20040902	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): GR; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040902;
20040902	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): SE; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040902;
20040903	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): DE; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040903;
20040913	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): ES; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040913;
20041027	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): IE; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20041027;
20041027	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LU; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20041027;

20041031	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): MC; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20041031;
20041125	(-)	LTIE	LT: INVALIDATION OF EUROPEAN PATENT OR PATENT EXTENSION Effective date: 20040602;
20041130	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): CH; Corresponding EP Code 1 for PRS Code (EP REG): PL;
20041201	(-)	NLV1	NL: LAPSED OR ANNULED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT; NO LEGAL EFFECT FROM
20041215	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; Effective date: 20040602;
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20050209	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): SE; Effective date: 20040902;
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20050316	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LI; Effective date: 20040602;
20050316	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): ES; Effective date: 20040913;
20050316	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FI; Effective date: 20040602;
20050316	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): GR; Effective date: 20040902;
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20050406	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): AT; Effective date: 20040602;
20050406	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): BE; Effective date: 20040602;
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20050406	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): ES; Effective date: 20040913;
20050406	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FI; Effective date: 20040602;
20050406	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): GR; Effective date: 20040902;
20050406	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): SE; Effective date: 20040902;
20050525	(+)	26N	NO OPPOSITION FILED Effective date: 20050303;
20050527	(-)	EN	FR: TRANSLATION NOT FILED
20050601	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): AT; Effective date: 20040602;
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20050601	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; Effective date: 20040602;
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EP1107125A3 20011114
EP1107125A2 20010613

(ENG) Apparatus and method for automated aggregation and delivery of and transactions involving electronic personal information or data

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: EP 00108964 A

Filing Date: 19991027

Issue/Publication Date: 20030604

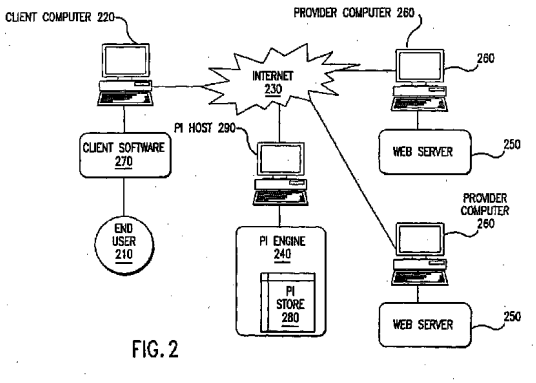

FIG. 2

Abstract: (ENG) A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor selects an end user for personal information aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

Priority Data: EP 99971117 19991027 A 3; US 10591798 19981028 P; US 13439599 19990517 P;

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20010613	(+)	17P	REQUEST FOR EXAMINATION FILED Effective date: 20000427;
20010613	(+)	AK	DESIGNATED CONTRACTING STATES: Kind code of corresponding patent document: A2; List of designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE;
20010613	(+)	AX	EXTENSION OF THE EUROPEAN PATENT TO : AL PAYMENT 20000427;LT PAYMENT 20000427;LV PAYMENT 20000427;MK PAYMENT 20000427;RO PAYMENT 20000427;SI PAYMENT 20000427;
20011114	(+)	AK	DESIGNATED CONTRACTING STATES: Kind code of corresponding patent document: A3; List of designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE;
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20020731	(+)	AKX	PAYMENT OF DESIGNATION FEES : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE;
20020731	(+)	AXX	PAYMENT OF EXTENSION FEES : AL PAYMENT 20000427;LT PAYMENT 20000427;LV PAYMENT 20000427;MK PAYMENT 20000427;RO PAYMENT 20000427;SI PAYMENT 20000427;
20030604	( )	AC	DIVISIONAL APPLICATION (ART. 76) OF: Corresponding patent document: 1198765; Country code of corresponding patent document: EP; Kind code of corresponding patent document: P;
20030604	(+)	AK	DESIGNATED CONTRACTING STATES: List of designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE;
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20030710	( )	REF	CORRESPONDS TO: Corresponding patent document: 69908610; Country code of corresponding patent document: DE; Publication date of corresponding patent document: 20030710; Kind code of corresponding patent document: P;
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20050116	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): ES; Corresponding EP Code 1 for PRS Code (EP REG): FD2A; Effective date: 20031028;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): AT; Effective date: 20030604;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): BE; Effective date: 20030604;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; Effective date: 20030604;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LI; Effective date: 20030604;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CY; Effective date: 20031027;
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20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FI; Effective date: 20030604;
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20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): GR; Effective date: 20030904;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): IE; Effective date: 20031028;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LU; Effective date: 20031027;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): MC; Effective date: 20031031;

20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): NL; Effective date: 20030604;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): PT; Effective date: 20030904;
20050119	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): SE; Effective date: 20030904;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): AT; Effective date: 20030604;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): BE; Effective date: 20030604;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; Effective date: 20030604;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LI; Effective date: 20030604;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CY; Effective date: 20031027;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): DK; Effective date: 20030904;
20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): ES; Effective date: 20031028;
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20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): IE; Effective date: 20031028;
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20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): MC; Effective date: 20031031;
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20050706	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): PT; Effective date: 20030904;
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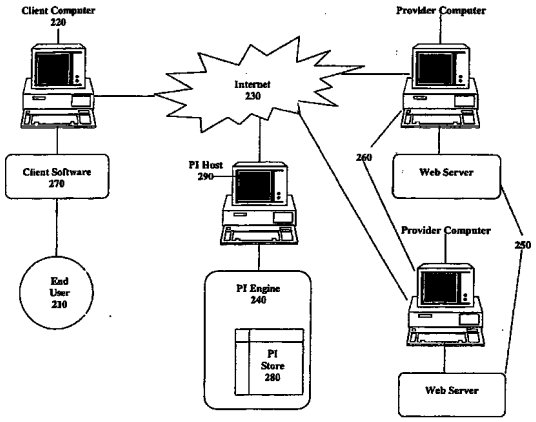
20061031	(+)	PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE Corresponding country code for PRS Code (EP REG): IT; Payment date: 20061031; Year of fee payment: 08;
20080930	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FR; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20031031;
20090831	()	PG25	Corresponding country code for PRS Code (EP REG): IT; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20071027;
20110325	()	REG	Corresponding country code for PRS Code (EP REG): FR; Corresponding EP Code 1 for PRS Code (EP REG): ST; Effective date: 20110218;

Figure 2



EP1198765B1 20040811
EP1198765A1 20020424

(ENG) APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF ELECTRONIC PERSONAL INFORMATION OR DATA

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; PARNAS LEON US ; RAJAN PALANISWAMY US ; BURSON ROBERT US ; KAIB PAUL US ; ULBERG DIMA US

Application No: EP 99971117 A

Filing Date: 19991027

Issue/Publication Date: 20040811

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 9925181 19991027 W W N; US 10591798 19981028 P Y; US 13439599 19990517 P Y;

Related Application(s): ;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Designated Countries:

Publication Language: ENG

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Agent(s): Gruenecker, Kinkeldey, Stockmair & Schwanhaeusser, Anwaltssozietaet Maximilianstrasse 58, 80538 Muenchen, DE DE

Legal Status:

Date	+/-	Code	Description
20040811	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): AT; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040811;
20040811	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA

			POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): BE; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040811;
20040811	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040811;
20040811	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CY; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040811;
20040811	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): FI; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20040811;
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20040813	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): CH; Corresponding EP Code 1 for PRS Code (EP REG): EP;
20040908	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): IE; Corresponding EP Code 1 for PRS Code (EP REG): FG4D;
20040916	( )	REF	CORRESPONDS TO: Corresponding patent document: 69919411; Country code of corresponding patent document: DE; Publication date of corresponding patent document: 20040916; Kind code of corresponding patent document: P;
20041027	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): IE; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20041027;
20041027	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LU; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20041027;
20041031	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): MC; : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES; Effective date: 20041031;
20041111	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): DK; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20041111;
20041111	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): GR; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20041111;
20041111	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): SE; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20041111;
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20041122	(-)	PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): ES; : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT; Effective date: 20041122;
20050125	(-)	LTIE	LT: INVALIDATION OF EUROPEAN PATENT OR PATENT EXTENSION Effective date: 20040811;
20050201	(-)	NLV1	NL: LAPSED OR ANNULED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT; NO LEGAL EFFECT FROM
20050215	( )	REG	REFERENCE TO A NATIONAL CODE Corresponding country code for PRS Code (EP REG): CH; Corresponding EP Code 1 for PRS Code (EP REG): PL;
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20050601	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; Effective date: 20040811;
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20050713	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): CH; Effective date: 20040811;
20050713	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): LI; Effective date: 20040811;
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			POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): DK; Effective date: 20041111;
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20050805	(-)	EN	FR: TRANSLATION NOT FILED
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20060118	(-)	25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO Corresponding country code for PRS Code (EP REG): SE; Effective date: 20041111;
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ES2200753T3 20040316

(SPA) APARATO Y METODO PARA AGREGACION Y SUMINISTRO AUTOMATIZADOS DE TRANSACCIONES QUE IMPLICAN INFORMACION O DATOS ELECTRONICOS PERSONALES.

[no drawing available]

Assignee: VERTICALONE CORP

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: ES 00108964 T

Filing Date: 19991027

Issue/Publication Date: 20040316

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status: There is no Legal Status information available for this patent

JP2002528819T 20020903

NotAvailable

Application No: JP 2000578743 T

[no drawing available]

Filing Date: 19991027

Issue/Publication Date: 20020903

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y; US 9925181 19991027 W W N;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status: There is no Legal Status information available for this patent

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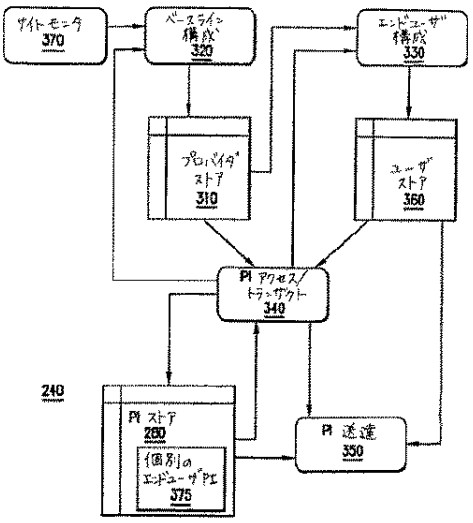
JP2004164573A 20040610



(ENG) DEVICE AND METHOD FOR AUTOMATED AGGREGATION, DEVICE AND METHOD FOR DELIVERING ELECTRONIC PERSONAL INFORMATION OR DATA AND TRANSACTION INCLUDING ELECTRONIC PERSONAL INFORMATION OR DATA

Assignee: VERTICALONE CORP

Inventor(s): GREG FUREISHUTATTO ; LEON PARNAS ; PARANISUWAMII RAJAN ; ROBERT BAASON ; PAUL KAIBU ; ULBERG DIMA

Application No: JP 2003174051 A

Filing Date: 20030618

Issue/Publication Date: 20040610

Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

Related Application(s): JP2000578743

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Legal Status: There is no Legal Status information available for this patent

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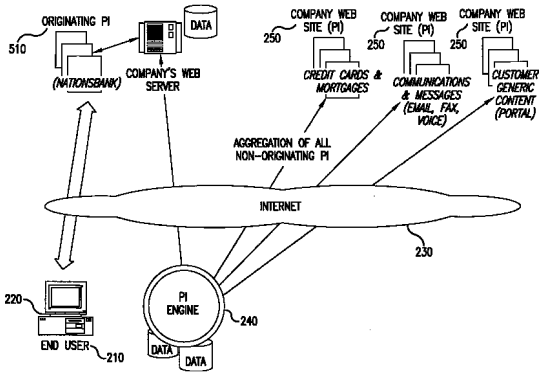
US6405245B1 20020611



(ENG) System and method for automated access to personal information

Assignee: VERTICALONE CORP US

Inventor(s): BURSON ROBERT US ; ULBERG DIMA US ; FREISHTAT GREGG US

Application No: US 42760299 A

Filing Date: 19991027

Issue/Publication Date: 20020611

Abstract: (ENG) This invention is a system and method for automated access to personal information associated with an end user, wherein the personal information is stored on a personal information provider. A representation of the personal information and a link corresponding to the personal information stored on the personal information are presented to the end use via a client computer. Upon activation of the link, the client computer is automatically driven to the personal information provider presenting to the user via the client computer a page on the personal information provider.

Priority Data: US 42760299 19991027 A Y; US 10591798 19981028 P Y; US 13439599 19990517 P Y;

Related Application(s): 60/105917 19981028 US; 60/134,395 19990517 US

IPC (International Class): G06Q03000; H04L02908; G06F01730; H04L02906

ECLA (European Class): H04L02906S10B; G06F01730W3; G06Q03000; H04L02908N1; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N29U; H04L02908N33

US Class: 709217; 707010; 707E17111; 715705

Publication Language: ENG

Filing Language: ENG

Agent(s): Needle & Rosenberg, P.C.

Examiner Primary: Coulter, Kenneth R.

US Post Issuance:

--US Litigations: Cashedge, Inc, Cashedge, Inc, 20050622 N.D. California 5:05cv2554 ; Cashedge, Inc, Cashedge, Inc, 20050622 N.D. California 3:05cv2554 ; Cashedge, Inc Cashedge, Inc 20060731 N.D. California 3:06cv4648

Assignments Reported to USPTO:

Reel/Frame: 10575/0251 **Date Signed:** 20000111 **Date Recorded:** 20000201
Assignee: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUITE 700 ATLANTA GEORGIA 30328

Assignor: BURSON, ROBERT; FREISHTAT, GREGG; ULBERG, DIMA

Corres. Addr: NEEDLE & ROSENBERG, P.C. GREGORY J. KIRSCH, ESQUIRE SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE STREET, N.E. ATLANTA, GA 30303-1811
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Reel/Frame: 18407/0808 **Date Signed:** 20060918 **Date Recorded:** 20061020
Assignee: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200 REDWOOD CITY CALIFORNIA 94065

Assignor: VERTICALONE CORPORATION

Corres. Addr: CENTRAL COAST PATENT AGENCY, INC. 3 HANGAR WAY, SUITE D WATSONVILLE, CA 95076
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Legal Status:

Date	+/-	Code	Description
20000201	( )	AS	ASSIGNMENT New owner name: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUI; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:BURSON, ROBERT;ULBERG, DIMA;FREISHTAT, GREGG;REEL/FRAME:010575/0251; Effective date: 20000111;
20000201	()	AS	New owner name: VERTICALONE CORPORATION, GEORGIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:BURSON, ROBERT;ULBERG, DIMA;FREISHTAT, GREGG;REEL/FRAME:010575/0251; Effective date: 20000111;
20000201	()	AS	New owner name: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUI; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:BURSON, ROBERT;ULBERG, DIMA;FREISHTAT, GREGG;REEL/FRAME:010575/0251; Effective date: 20000111;
20060328	()	REAM	Year of fee payment: 4;
20060920	()	ASLP	ASSIGNMENT New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:018407/0808; Effective date: 20060918;
20061020	()	AS	New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:018407/0808; Effective date: 20060918;
20061020	()	AS	New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:018407/0808; Effective date: 20060918;

20091105 () FPAY Year of fee payment: 8;

US6871220B1 20050322

(ENG) System and method for distributed storage and retrieval of personal information

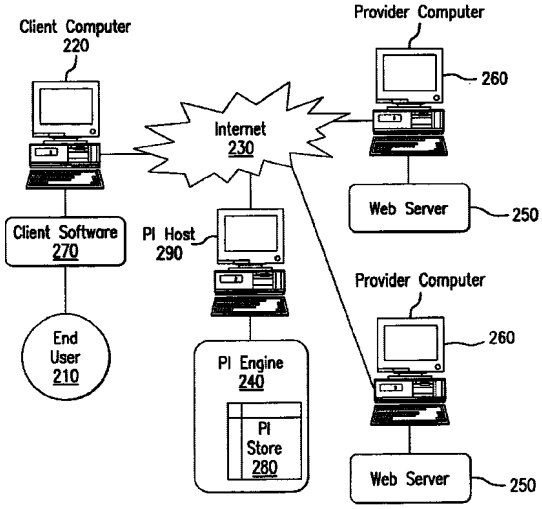
Assignee: YODLEE INC US

Inventor(s): RAJAN PALANISWAMY US ; FREISHTAT GREGG US

Application No: US 42778799 A

Filing Date: 19991027

Issue/Publication Date: 20050322



Abstract: (ENG) A system for distributing, storing and retrieving information associated with an end user from one or more information providers between a host computer and a client computer associated with the end user according to the present invention includes a host computer with a processor. The processor aggregates information associated with the end user and transmits the information to the client computer associated with the end user. The processor receives requests concerning the aggregated information from a variety of sources. The processor also receives the previously transmitted aggregated information from the client computer. The processor proceeds to service the received request based on the aggregated information received from the client computer.

Priority Data: US 42778799 19991027 A Y; US 13439599 19990517 P Y; US 10591798 19981028 P Y;

Related Application(s): 60/134395 19990517 00 60/105917 19981028 00

IPC (International Class): H04L02906; G06Q03000; H04L02908

ECLA (European Class): H04L02908N1; G06Q03000; H04L02906; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N29U; H04L02908N33

US Class: 709218; 705010; 705035; 707010; 709203; 709217; 709224

Agent(s): Needle & Rosenberg, P.C.

Examiner Primary: Alam, Hosain

Examiner Assistant: Nguyen, Thu Ha

Assignments Reported to USPTO:

Reel/Frame: 10575/0246 **Date Signed:** 20000111 **Date Recorded:** 20000201
Assignee: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUITE 700 ATLANTA GEORGIA 30328

Assignor: FREISHTAT, GREGG ; RAJAN, PALANISWAMY

Corres. Addr: NEEDLE & ROSENBERG, P.C. GREGORY J. KIRSCH, ESQUIRE SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE, N.E. ATLANTA, GEORGIA30303-1811
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Reel/Frame: 18407/0811 **Date Signed:** 20060928 **Date Recorded:** 20061020

Assignee: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200 REDWOOD CITY CALIFORNIA 94065

Assignor: VERTICALONE CORPORATION

Corres. Addr: CENTRAL COAST PATENT AGENCY, INC. 3 HANGAR WAY, SUITE D WATSONVILLE, CA 95076

Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FORDETAILS).

Legal Status:

Date	+/-	Code	Description
20000201	()	AS	New owner name: VERTICALONE CORPORATION, GEORGIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:RAJAN, PALANISWAMY;FREISHTAT, GREGG;REEL/FRAME:010575/0246; Effective date: 20000111;
20061020	( )	AS	ASSIGNMENT New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:018407/0811; Effective date: 20060928;
20061020	()	AS	New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:018407/0811; Effective date: 20060928;
20061020	()	AS	New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:018407/0811; Effective date: 20060928;
20080826	()	FPAY	Year of fee payment: 4;

US7552190B1 20090623

(ENG) System and method for automated electronic notification and transaction execution

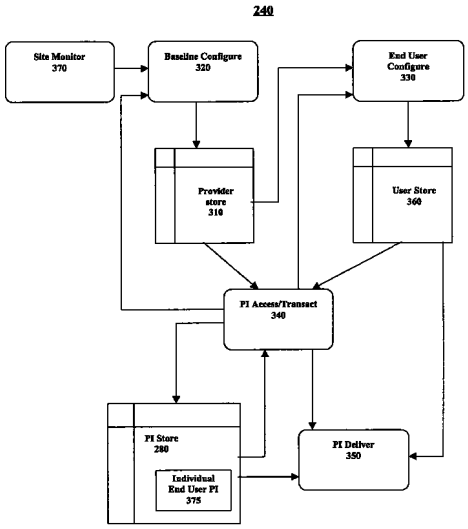
Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: US 42779099 A

Filing Date: 19991027

Issue/Publication Date: 20090623



Abstract: (ENG) This invention is a system and method for automated notification of occurrences of events related to personal information and/or the automated execution of transactions involving personal information based on events related to the personal information. A user profile associated with each end user of personal information is scanned to determine whether any trigger event related to the personal information associated with each end user has occurred. For each trigger event found to have occurred, a response associated with the found trigger event is executed. The response will be notification to the end user of the occurrence of the trigger event, the execution of a transaction involving personal information of the end user for whom the trigger event occurred or a combination of notification and execution.

Priority Data: US 42779099 19991027 A N; US 13439599 19990517 P Y; US 10591798 19981028 P Y;

Related Application(s): 60134,395 19990517 US; 105917P 19981028 US

IPC (International Class): G06F01300; G06F01516; G06F01500; G06F015173; H04L02906; G06F01730; H04L02908; G06Q03000

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

US Class: 709217; 709201; 709203; 709223

Publication Language: ENG

Filing Language: ENG

Agent(s): Ballard Spahr Andrews & Ingersoll, LLP

Examiner Primary: Vaughn, Jr, William C

Examiner Assistant: Shingles, Kristie D

Assignments Reported to USPTO:

Reel/Frame: 10568/0963 **Date Signed:** 20000111 **Date Recorded:** 20000131

Assignee: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUITE 700 ATLANTA GEORGIA 30328

Assignor: FREISHTAT, GREGG; RAJAN, PALANISWAMY

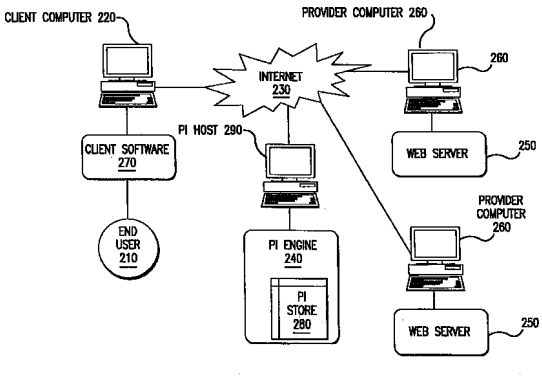
Corres. Addr: NEEDLE & ROSENBERG, P.C. GREGORY J. KIRSCH, ESQUIRE SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE STREET, N.E. ATLANTA, GA 30303-1811

Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Legal Status: There is no Legal Status information available for this patent

US6567850B1 20030520

(ENG) System and method for determining revenue from an intermediary derived from servicing data requests



Assignee: YODLEE INC US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: US 42779499 A

Filing Date: 19991027

Issue/Publication Date: 20030520

Abstract: (ENG) This invention is a system and method for determining revenue from an intermediary derived from end user interactions involving personal information via the intermediary. A host computer monitors interactions between end users and personal information providers via an intermediary computer. The host computer communicates with a personal information store for storing personal information associated with end users and an accounting store for storing accounting data associated with the intermediary computer. The host computer includes a processor that receives requests concerning personal information from the intermediary computer and services these requests based on personal information in the personal information store. The host computer processor updates the accounting data associated with the intermediary computer and generates invoices to the intermediary computer based on the updated accounting data.

Priority Data: US 42779499 19991027 A Y; US 10591798 19981028 P Y; US 13439599 19990517 P Y;

Related Application(s): 60/105917 19981028 00 60/134395 19990517 00

IPC (International Class): H04L02906; G06Q03000; H04L02908

ECLA (European Class): H04L02906S10B; G06Q03000; H04L02906; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27E; H04L02908N29U; H04L02908N33

US Class: 709224; 705034

Agent(s): Needle & Rosenberg, P.C. 0

Examiner Primary: Rice, Kenneth R.

US Post Issuance:

--US Litigations: Cashedge, Inc, Yodlee, Inc, 20050622 N.D. California 5:05cv2554 ; Cashedge, Inc, Yodlee, Inc, 20050622 N.D. California; Cashedge, Inc Yodlee, Inc 20060731 N.D. California 3:06cv4648

Assignments Reported to USPTO:

Reel/Frame: 10586/0541 **Date Signed:** 20000111 **Date Recorded:** 20000124

Assignee: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUITE 700 ATLANTA GEORGIA 30328

Assignor: FREISHTAT, GREGG; RAJAN, PALANISWAMY

Corres. Addr: NEEDLE & ROSEBERG, P.C. DAVID S. KERVEN, ESQUIRE SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE STREET, N.E. ATLANTA, GA30303-1811
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Reel/Frame: 13369/0502 **Date Signed:** 20030121 **Date Recorded:** 20030121
Assignee: YODLEE, INC. 3600 BRIDGE PARKWAY SUITE 200 REDWOOD SHORES CALIFORNIA 94065

Assignor: VERTICALONE CORPORATION

Corres. Addr: NEEDLE & ROSENBERG P C 127 PEACHTREE STREET N E ATLANTA, GA 30303-1811
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FORDETAILS).

Legal Status:

Date	+/-	Code	Description
20000124	( )	AS	ASSIGNMENT New owner name: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUI; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:FREISHTAT, GREGG;RAJAN, PALANISWAMY;REEL/FRAME:010586/0541; Effective date: 20000111;
20000124	()	AS	New owner name: VERTICALONE CORPORATION, GEORGIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:FREISHTAT, GREGG;RAJAN, PALANISWAMY;REEL/FRAME:010586/0541; Effective date: 20000111;
20000124	()	AS	New owner name: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUI; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:FREISHTAT, GREGG;RAJAN, PALANISWAMY;REEL/FRAME:010586/0541; Effective date: 20000111;
20030121	( )	AS	ASSIGNMENT New owner name: YODLEE, INC. 3600 BRIDGE PARKWAY SUITE 200REDWOOD; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:013369/0502; Effective date: 20030121;
20030121	()	AS	New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:013369/0502; Effective date: 20030121;
20030121	()	AS	New owner name: YODLEE, INC. 3600 BRIDGE PARKWAY SUITE 200REDWOOD; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:013369/0502; Effective date: 20030121;
20060914	()	FPAY	Year of fee payment: 4;
20101013	()	FPAY	Year of fee payment: 8;

US7765279B1 20100727

(ENG) System and method for scheduling harvesting of personal information

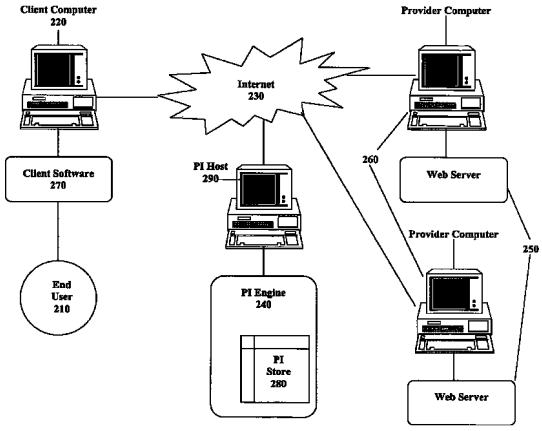
Assignee: VERTICALONE CORP US

Inventor(s): KAIB PAUL US ; FREISHTAT GREGG US

Application No: US 42781199 A

Filing Date: 19991027

Issue/Publication Date: 20100727



Abstract: (ENG) This invention is a system and method for a system and method for scheduling the harvesting of information associated with one or more end users from one or more information providers. A host computer, including a processor, is in communication with a user data store for storing data associated with users and an information provider store for storing data associated with information providers. For each end user, a profile of past access times, login times, is maintained in the user data store. For each information provider, a profile of update times and criteria are maintained in the information provider store. For a selected information provider, the host computer processor determines an update time for information stored by the selected information provider and a set of end users whose information could be modified by an update at that update time. The host computer processor generates a predicted login time for each end user in the determined set of end users and each generated login time back a predetermined time interval. The host computer processor sorts the determined set of end users according to the predicted login time or shifted login time and assigns a harvesting time for each end user based on each end user's shifted or predicted login time.

Priority Data: US 42781199 19991027 A N; US 13439599 19990517 P Y; US 10591798 19981028 P Y;

Related Application(s): 60134,395 19990517 US; 105917P 19981028 US

IPC (International Class): G06F01300; G06F01516; G06F01500; H04L02908; G06Q03000; G06F01730; H04L02906

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

US Class: 709218; 709224; 705035

Publication Language: ENG

Agent(s): Ballard Spahr Andrews & Ingersoll, LLP

Examiner Primary: Winder, Patrice

Examiner Assistant: Mirza, Adnan M

Assignments Reported to USPTO:

Reel/Frame: 10559/0832 **Date Signed:** 20000111 **Date Recorded:** 20000124

Assignee: VERTICALONE CORPORATION SUITE 700 TWO CONCOURSE PARKWAY ATLANTA GEORGIA 30328

Assignor: KAIB, PAUL; FREISHTAT, GREGG

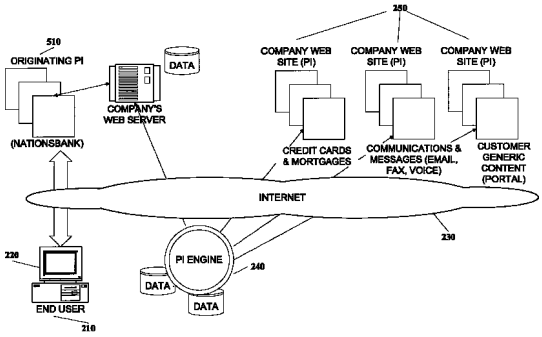
Corres. Addr: NEEDLE &ROSENBERG, P.C DAVID S. KERVEN, ESQ. SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE STREET, N.E. ATLANTA, GA 30303-1811

Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Legal Status:

Date	+/-	Code	Description
20000124	()	AS	New owner name: VERTICALONE CORPORATION,GEORGIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:KAIB, PAUL;FREISHTAT, GREGG;REEL/FRAME:10559/832; Effective date: 20000111;

US6317783B1 20011113



(ENG) Apparatus and methods for automated aggregation and delivery of and transactions involving electronic personal information or data

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG US ; RAJAN PALANISWAMY US

Application No: US 42851199 A

Filing Date: 19991027

Issue/Publication Date: 20011113

Abstract: (ENG) A system for delivering personal information according to the present invention includes a user store including end user data, a provider store including information provider data, a personal information store including personal information and a processor that communicates with these data stores. The processor selects an end user for personal infonmation aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information is stored in the personal information store.

Priority Data: US 42851199 19991027 A Y; US 10591798 19981028 P Y; US 13439599 19990517 P Y;

Related Application(s): 60/105917 19981028 00 60/134395 19990517 00

IPC (International Class): H04L02906; G06Q03000; H04L02908

ECLA (European Class): H04L02906S10B; G06Q03000; H04L02906; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27E; H04L02908N29U; H04L02908N33

US Class: 709218; 707010

Agent(s): Needle & Rosenberg. P.C. 0

Examiner Primary: Coulter, Kenneth R.

US Post Issuance:

--US Litigations: Yodlee Inc. Block Financial Corp 20030625 Delaware CA 03- 0600 ; Cashedge, Inc, Yodlee, Inc, 20050622 N.D. California 5:05cv2554 ; Cashedge, Inc, Yodlee, Inc, 20050622 N.D. California 3:05cv2554 ; Cashedge, Inc Yodlee, Inc 20060731 N.D. California 3:06cv4648

Assignments Reported to USPTO:

Reel/Frame: 10559/0670 **Date Signed:** 20000111 **Date Recorded:** 20000124
Assignee: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUITE 700 ATLANTA GEORGIA 30328

Assignor: FREISHTAT, GREGG; RAJAN, PALANISWAMY

Corres. Addr: NEEDLE & ROSENBERG, P.C. DAVID S. KERVEN, ESQUIRE SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE STREET, N.E. ATLANTA, GEORGIA30303-1811
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Reel/Frame: 12331/0682 **Date Signed:** 20010116 **Date Recorded:** 20011204
Assignee: VERTICALONE CORPORATION SUITE 200 3600 BRIDGE PARKWAY REDWOOD SHORES CALIFORNIA 94065

Assignor: VIRGO ACQUISITION CORPORATION

Corres. Addr: NEEDLE & ROSENBERG, P.C. LAWRENCE D. MAXWELL, ESQ. SUITE 1200, THE CANDLER BULDING 127 PEACHTREE STREET, N.E. ATLANTA, GA30303-1811
Brief: MERGER (SEE DOCUMENT FOR DETAILS).

Reel/Frame: 12444/0201 **Date Signed:** 20011023 **Date Recorded:** 20020109
Assignee: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200 REDWOOD SHORES CALIFORNIA 94065

Assignor: VERTICALONE CORPORATION

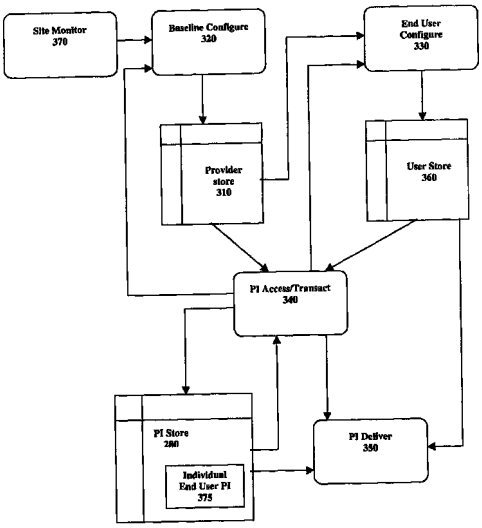
Corres. Addr: NEEDLE & ROSENBERG, P.C. LAWRENCE D. MAXWELL, ESQ. SUITE 1200, THE CANDLER BUILDING 127 PEACHTREE STREET, N.E. ATLANTA, GEORGIA30303-1811
Brief: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Legal Status:

Date	+/-	Code	Description
20000124	( )	AS	ASSIGNMENT New owner name: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUI; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:FREISHTAT, GREGG;RAJAN, PALANISWAMY;REEL/FRAME:010559/0670; Effective date: 20000111;
20000124	()	AS	New owner name: VERTICALONE CORPORATION, GEORGIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:FREISHTAT, GREGG;RAJAN, PALANISWAMY;REEL/FRAME:010559/0670; Effective date: 20000111;
20000124	()	AS	New owner name: VERTICALONE CORPORATION TWO CONCOURSE PARKWAY, SUI; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:FREISHTAT, GREGG;RAJAN, PALANISWAMY;REEL/FRAME:010559/0670; Effective date: 20000111;
20011204	( )	AS	ASSIGNMENT New owner name: VERTICALONE CORPORATION SUITE 200 3600 BRIDGE PARK; : MERGER;ASSIGNOR:VIRGO ACQUISITION CORPORATION;REEL/FRAME:012331/0682; Effective date: 20010116;

20011204	( )	AS	ASSIGNMENT New owner name: VERTICALONE CORPORATION SUITE 200 3600 BRIDGE PARK; : MERGER;ASSIGNOR:VIRGO ACQUISITION CORPORATION /AR;REEL/FRAME:012331/0682; Effective date: 20010116;
20011204	()	AS	New owner name: VERTICALONE CORPORATION, CALIFORNIA; : MERGER;ASSIGNOR:VIRGO ACQUISITION CORPORATION;REEL/FRAME:012331/0682; Effective date: 20010116;
20011204	()	AS	New owner name: VERTICALONE CORPORATION SUITE 200 3600 BRIDGE PARK; : MERGER;ASSIGNOR:VIRGO ACQUISITION CORPORATION;REEL/FRAME:012331/0682; Effective date: 20010116;
20011204	()	AS	New owner name: VERTICALONE CORPORATION SUITE 200 3600 BRIDGE PARK; : MERGER;ASSIGNOR:VIRGO ACQUISITION CORPORATION /AR;REEL/FRAME:012331/0682; Effective date: 20010116;
20020109	( )	AS	ASSIGNMENT New owner name: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200 REDWOO; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:012444/0201; Effective date: 20011023;
20020109	( )	AS	ASSIGNMENT New owner name: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200REDWOOD; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION /AR;REEL/FRAME:012444/0201; Effective date: 20011023;
20020109	()	AS	New owner name: YODLEE, INC., CALIFORNIA; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:012444/0201; Effective date: 20011023;
20020109	()	AS	New owner name: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200 REDWOO; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION;REEL/FRAME:012444/0201; Effective date: 20011023;
20020109	()	AS	New owner name: YODLEE, INC. 3600 BRIDGE PARKWAY, SUITE 200REDWOOD; : ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:VERTICALONE CORPORATION /AR;REEL/FRAME:012444/0201; Effective date: 20011023;
20050329	()	FPAY	Year of fee payment: 4;
20090609	()	FPAY	Year of fee payment: 8;
20090609	()	SULP	Year of fee payment: 7;

WO2000025227A1 20000504



(ENG) APPARATUS AND METHOD FOR AUTOMATED AGGREGATION AND DELIVERY OF ELECTRONIC PERSONAL INFORMATION OR DATA

Assignee: VERTICALONE CORP US

Inventor(s): FREISHTAT GREGG ; PARNAS LEON ; RAJAN PALANISWAMY ; BURSON ROBERT ; KAIB PAUL ; ULBERG DIMA

Application No: US 9925181 W

Filing Date: 19991027

Issue/Publication Date: 20000504

Abstract: (ENG) A system for delivering personal information according to the present invention includes a user store (360) including end user data, a provider store (310) including information provider data, a personal information store (280) including personal information (375) and a processor that communicates with these data stores. The processor selects an end user for personal information aggregation. The processor connects with one or more information providers. The processor then proceeds to retrieve personal information for the selected end user from the connected information providers. This retrieval is based on end user data associated with the selected end user and provider data associated with the connected information providers. The retrieved personal information (375) is stored in the personal information store (280).

Priority Data: US 10591798 19981028 P Y; US 13439599 19990517 P Y;

IPC (International Class): G06F01300; G06F01500; H04L02906; G06Q03000; G06F01730; H04L02908

ECLA (European Class): H04L02908N33; G06F01730W1F; G06Q03000; H04L02906S10B; H04L02908N1; H04L02908N9; H04L02908N19; H04L02908N23; H04L02908N25; H04L02908N27; H04L02908N27I; H04L02908N29U

Designated Countries:

----Designated States: (national) AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW ::: (ARIPO) AP GH GM KE LS MW SD SL SZ TZ UG ZW
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20000203	( )	ENP	ENTRY INTO THE NATIONAL PHASE IN: Corresponding country code for PRS Code (EP REG): AU; Corresponding patent document: 2000 12367; Kind code of corresponding patent document: A;

20000324	(+)	WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE Corresponding patent document: 12367/00; Country code of corresponding patent document: AU;
20000405	(+)	WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE Corresponding patent document: 1999971117; Country code of corresponding patent document: EP;
20000412	( )	ENP	ENTRY INTO THE NATIONAL PHASE IN: Corresponding country code for PRS Code (EP REG): CA; Corresponding patent document: 2306083; Kind code of corresponding patent document: A;
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20000504	(+)	AL	DESIGNATED COUNTRIES FOR REGIONAL PATENTS Kind code of corresponding patent document: A1; List of designated states: GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG;
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20000628	( )	121	EP: THE EPO HAS BEEN INFORMED BY WIPO THAT EP WAS DESIGNATED IN THIS APPLICATION
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20011206	(+)	WWG	WIPO INFORMATION: GRANT IN NATIONAL OFFICE Corresponding patent document: 12367/00; Country code of corresponding patent document: AU;
20011217	( )	NENP	NON-ENTRY INTO THE NATIONAL PHASE IN: Corresponding country code for PRS Code (EP REG): RU;
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