Title: A SYSTEM, COMPUTER PRODUCT AND METHOD FOR PROCESSING WIRELESS INSTRUCTIONS AT A PRIVATE COMMUNICATION PORTAL

Abstract: A system, computer product and method for providing a private communication portal at a first computer connected to a network of computers includes a communication facility resident at the first computer, and a second computer including a locating facility for locating the current location of the first computer on the network, where the second computer facilitates communication between the first computer and a third computer by authenticating the third computer for communication with the first computer and providing the location of the first computer for communication with the third computer. This invention further relates to a method for implementing a private communication portal that permits for remotely accessing and responding to instructions processed by a two-way pager network.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
A system, computer product and method for processing wireless instructions at a private communication portal

Field of the Invention

This invention relates in general to a system, computer product and method for remotely accessing data at a private server using a remote wired or wireless web browser. This invention also relates to a system, computer product and method for remotely accessing and managing different types of messages at a private server using a remote wired or wireless web browser. This invention further relates to a method for implementing a private communication portal that permits for remotely accessing and responding to instructions processed by a two-way pager network.

Background of the Invention

Individuals and businesses today communicate through a variety of messages including electronic mail (including e-mails with video or voice attachments or AOL™ “instant messages”), pager messages, facsimile (fax) and electronic voice mail, document transfer, file transfer and structured data transfer.

In many cases these messages are managed by more than one computer program. Such multi-program solutions are cumbersome as they generally require significant familiarity with more than one program and further require accessing each program to manage the receipt and dispatch of different types of messages. This results in loss of time and overly complex means for achieving user objectives.

Often a multi-user server located in a remote location and accessed electronically over a network manages such communication. Such servers not only control access to personal data belonging to a plurality of users, but they also act as repositories for such personal data, either temporarily or over a significant period. Consequently, issues of security, scalability, dependability and concurrent access to data are significant.
Single-user programs for managing such variety of messages are known, but such known programs do not provide full remote access via the Internet to management of messages, documents, data files and contact information. The use of the Internet is desirable for numerous reasons, including the common use of the Internet Protocol as a communication standard, the general availability of electronic devices that are Internet-enabled and the cost savings of using the Internet. Full Internet access is desirable because message, document, data and contact management users may want to access their message, document, data and contact management systems from a plurality of locations and/or plurality of communication devices (e.g. lap top, cellular phone or hand held computer etc.). Full remote access permits the receipt of messages or documents at any location on any type of communication device, with remote access to functions of the message management system such as address books, security settings, rules (e.g. automated response), text-to-speech functionality etc.

Prior art messaging systems and programs such as SYMANTEC's TM TALK WORKS PRO™, SIEMENS™ XPRESSIONS470™ NOKIA/TELEKOL™ INTEGRAX™, INTERSIS™ VOIXX™, KONTACT™ VEMA2.0™ and BLUEJADE.COM™ TECSTM do not provide full Internet access as described above, and further particularized below.

It is desirable to provide a system, computer product and method that does not require the use of a multi-user server. In other words, it is desirable to provide the "unified" capability of managing the variety of information described where there is no 3rd party service provider who acts as an intermediary between the user and entities with whom the user communicates. This results in a reduction in service fees charged by such 3rd party service provider. It is further desirable to provide such a system, computer product and method that is flexible, permits remote access to personal data, and provides security of such personal data.
It should be understood that by a “multi-user server”, a server is meant that is configured for use by more than one “user” wherein each user may consist of a business with a plurality of individual users.

There are numerous disadvantages to such prior art systems requiring such 3rd party intermediaries. First, such prior art systems generally require payment of significant user fees, payable so long as the system is used. Second, such 3rd party intermediary systems do not generally provide the full flexibility, customization, security and access to personal data, that can be provided by a private user system and computer product. Third, engaging the flexibility, customization, security and access features of such 3rd party intermediary system is cumbersome. Fourth, data associated with such 3rd party intermediary systems such as contact data needs be replicated from the user's personal server to the 3rd party systems. In most prior art systems there are security risks to such replication, as the necessary data transfers generally do not occur on a secure basis, or if security provisions are made, such security provisions may be difficult to guarantee. Fifth, use of such 3rd party intermediary systems implies providing access codes to such 3rd party. Using such access codes, a rogue would have access to the personal data of the user and could, for example, send a damaging e-mail to the contacts of the user. While such 3rd party intermediaries will generally have procedures in place to reduce the likelihood of such an occurrence, such occurrences are possible nonetheless.

Therefore, a system for providing a private communication portal is required that is easy to use and relatively inexpensive. By “private” what is meant is that the communication portal is dedicated to a user rather than multiple users as is the case with 3rd part intermediary systems described above.

It should also be understood from the outset that in referring to “private communication portal”, the word “communication” is used in accordance with its broad technical definition. In particular, “communication” for the purpose of this document means exchange or accessing of any information, including information
formats, using predefined protocols understood by communicating entities. It should be understood that for “communication” to occur, there is no requirement for a human user. “Communication” can in this way be contrasted from “messaging” which is generally understood to relate to communication between more than one human user.

Also, by “portal” what is generally understood is a means for facilitating communication from point A to B. More than one interconnected computer or process may co-operate to provide a single “portal”. For example, a first computer or process comprising the “portal” may provide means for locating B at least once. Thereafter, communication between A and B may be facilitated through a second computer or process independent of the first computer or process.

In operation, the present invention provides a private communication portal for remotely managing and accessing messages, as described herein. However, it should be understood that messages are only one form of data that can be communicated in co-operation with the present invention. The invention provides means for operating a private server as a communication server for a variety of purposes, including video monitoring. For example, the private communication portal described herein provides means for accessing and managing such data remotely, such as forwarding images detecting movement to an observation station.

Providing such a private communication portal system and computer product presents a number of problems. First, the computer on which the private communication portal resides is required to be located on the Internet using a Web browser or WAP device. Second, a system is required that provides a secure Internet connection to said computer of the user. Third, but on a related point, the system needs to authenticate the user and reject unauthorized access. Fourth, messages need be transferred securely between the remote user and said computer.

Thus a system, computer product and method for providing full Internet access to message, data document and contact management functions is desirable, by means of a private communication portal. It is further desirable to provide a system and
computer product for providing message, data, document and contact management without a 3rd party intermediary, by means of a private communication portal.

It should also be noted that 3rd party service providers such as Internet Service
Providers do not generally allow their users to establish their own dedicated Internet
servers, or if they do so it is at a cost that is generally significant. This is because the
user’s Internet Protocol address generally changes from time to time for system
resource management reasons. A dedicated Internet Protocol address can be obtained,
but generally only at a premium.

Thus, there is also need for a system, computer product and method for
accessing and managing data remotely, even when the Internet Protocol address of a
user’s computer changes from time to time.

Another aspect of providing such a private communication portal as
described above is integrating same with 2-way pager devices such as Glenayre’s
@ctivelink™ and RIM’s Blackberry™ pagers. The private communication portal
referred to herein permits connection with such prior art paging networks. For
example, when a message is received by the private communication portal, a
notification can be sent to the paging networks, in a manner that is known. For
example, this notification can include information regarding the identity of a caller
who has left a voicemail at the private communication portal. It is desirable to be able
to elicit a response from the private communication portal by means of such pager
devices and pager networks. For example, where a user is notified by means of a
pager device that “VOICEMAIL RECEIVED FROM X”, it is desirable that user be
able to engage a “OBTAIN VOICEMAIL” function at such pager device. In response
to such function, it is further desirable that the pager network be able to deliver a
message to the private communication portal requesting that the private
communication portal call the telephone number phoned of the user and provide in
such telephone call the content of the voice mail. Likewise, for a “FACSIMILE
RECEIVED FROM Y”, it is desirable that the user may engage the “FORWARD
FAX” function at such pager device to request that the private communication portal
call the facsimile number specified by the user and deliver the message to the facsimile device at that number.

In discussion of a 2-way pager network in this disclosure, we are referring to a wireless network that is designed to broadcast limited length messages from an Internet server to a mobile receiving device where the mobile receiving device may be anywhere within the coverage area of the paging system. The mobile receiving device is also able to originate limited length messages and to send them to any specified Internet server via the wireless network. The Internet and the mobile receiving device do not need to set up a “session” or “logical connection” in order to exchange information in such 2-way pager networks.

There are obstacles to eliciting such a remote response using a pager network. Such pager networks generally comprise a pager instruction transfer means, such as a mail server, or more particularly, an SMTP server for communicating messages related to the operation of the paging networks, in a manner that is known.

In the particular example cited above, the request to the private communication portal is generally communicated to the SMTP server, which in turn is communicated to the private communication portal by means of the Location Facility (described below).

The private communication portal is generally connected to the Internet in a manner that messages received by the private communication portal are not provided immediately, but rather subject to a time delay, as is well known. In particular, in most known implementations of the private communication portal, such messages are collected, for example, by the Internet Service Provider’s server computer by polling such server computer from time to time. This time delay is in some cases a consequence of technical limitations of such Internet access, or in other cases, a consequence of system resource saving procedures.
In providing the remote response using a pager network as described above, the time delay referred to can cause relatively significant inconvenience. For example, in the specific example provided, if a user of the pager device and private communication portal requires delivery of a voice mail immediately, relatively significant wait for such delivery may cause inconvenience.

Therefore there is a need for a private communication portal, and method of implementing same, that minimizes the impact of such time delay.

Summary of the Invention

In accordance with one aspect of the present invention, a system, computer product and method for a private communication portal is provided.

In accordance with another aspect of the present invention, a system, computer product and method for providing full Internet access to and management of data resident on a computer is provided.

In accordance with yet another aspect of the present invention, a system, computer product and method for providing remote access and management of messages and contact information is provided.

In accordance with yet another aspect of the present invention, a system, computer product and method for providing a user with a private server for remote access to data resident on user's computer is provided despite 3rd party service provider restrictions that prevent a user from establishing their own Internet server.

The present invention has numerous advantages such as convenient remote access to data such as messages and contact information via any number of electronic devices such as a lap top, cellular phone or WAP-enabled hand held computer etc. In particular, the present invention not only allows messages of all types to be read, but
also to be replied to remotely. The present invention has the added benefit of reducing toll charges generally associated with remote message access.

Another significant benefit of the present invention is the ability to use current e-mail addresses, fax numbers or phone numbers rather than obtain a new one as is generally required by 3<sup>rd</sup> party service providers described above. Transition to a new e-mail address, for example, generally requires the various ordinary recipients of e-mail from a user to update their contact information. This generally results in loss of time in managing the transition (changing contact information, creating pointer from old e-mail addresses) and can potentially result in loss or delay of communications.

In the present invention, the user determines security and access. This provides greater flexibility and greater control of data by allowing, for example, remote forwarding of messages.

Also, in a multi-user system, depending on the number of users accessing the 3<sup>rd</sup> party system at any given time, the performance of the multi-user messaging system can be negatively affected. The invention described herein provides means for ensuring optimal performance of the user's messaging system.

It should also be understood that said 3<sup>rd</sup> party systems generally, for system resource management reasons, set limits to the amount of disk space allocated to each individual user for the purpose of storing data such as messages and contact information. This poses a problem in providing adequate means for archiving such data. Data archiving is either not provided by such 3<sup>rd</sup> party systems, in which case, such data needs be exported (if permitted by the 3<sup>rd</sup> party system) to the user's system or some other system. This may result in inconvenience and/or time loss. Alternatively, data archiving may be offered by such 3<sup>rd</sup> party system intermediary, but generally at a premium.
More generally, as is readily understood to those skilled in the art, the present invention permits a user's computer to act as a "private server" which can be configured in accordance with the user's requirements.

In a still other aspect of the present invention a system, computer product and method for a private communication portal that permits a connection with a paging network with minimized time delay is provided.

**Brief Description of the Drawings**

A detailed description of the preferred embodiment(s) is(are) provided herein below by way of example only and with reference to the following drawings, in which:

Figure 1 is a system resource flowchart, in accordance with a preferred embodiment of the present invention;

Figure 2 is a system resource flow chart of the preferred embodiment of the present invention, but illustrating the connection of the system to a wireless network.

Figure 3 is a system resource flow chart illustrating the resources of the Server Computer of the present invention.

Figure 4 is a system resource flow chart illustrating the resources of the Private Server of the present invention.

Figure 5 further illustrates the functions of the present invention.

Figure 6 is a program function chart illustrating the operation of the Fax/Voice/Data Communication Interface of the present invention.
Figure 7 is a program function chart illustrating the operation of the E-Mail Communication Interface of the present invention.

Figure 8 is a program function chart illustrating the operation of the E-Mail Message Facility of the present invention, in association with the Remote Message Management Facility.

Figure 9 is a program function chart illustrating the operation of Voice Message Facility of the present invention, in association with the Remote Message Management Facility.

Figure 10 is a program function chart illustrating the operation of Fax Message Facility of the present invention, in association with the Remote Message Management Facility.

Figure 11 is a program function chart illustrating the operation of the Contact Information Facility of the present invention.

Figure 12 is a program function chart illustrating the operation of the Remote Message Management Facility of the present invention.

Figure 13 is a system resource flowchart, in accordance with a preferred embodiment of the present invention, illustrating the connection of the system to a paging network;

Figure 14 is a program resource flow chart illustrating the resources of the computer product of the present invention resident on the Private Server, connected to a paging network;

Figure 15 illustrates the functions of the present invention connected to a 2-way pager network;
Figure 16 illustrates the functions of the Mobile Communication Facility of the present invention.

In the drawings, preferred embodiments of the invention are illustrated by way of example. It is to be expressly understood that the description and drawings are only for the purpose of illustration and as an aid to understanding, and are not intended as a definition of the limits of the invention.

Detailed Description of the Preferred Embodiment

Referring to Fig. 1, there is illustrated in a system resource flowchart the preferred embodiment of the present invention illustrated herein. In particular, Fig. 1 illustrates the resources that comprise the private communication portal or “PCP” of the present invention. PCP comprises a multiple computer architecture further comprising a Registration and DNS Server Computer or Server Computer, Private Server and a “Requesting Device”. A “Requesting Device” in this disclosure refers to any electronic communication means such as a telephone, cell phone, lap top or the like. “Requesting Device” also specifically includes wireless communication means, including a “Mobile Client Device” connected to a 2-way pager network.

It should be understood that Private Server may comprise a network station, personal computer terminal or server, provided that such Private Server is devoted to a private user who may be a business or individual. Said Private Server also comprises a message and data management server, as best illustrated in Fig. 1 and a network name that identifies the particular private server, as is well known.

It is desirable to provide Private Server with a permanent Internet connection provided, for example, by a coaxial cable connection or high speed xDSL telephone connection or the like, also shown in Fig. 1.
Server Computer 12 is connected with unrestricted access to an interconnected network of computers such as the Internet 16. Server Computer 12 may comprise one or more computers, as is well known.

Private Server 14 is provided with a computer product of the present invention dedicated to Private Server 14. In a first preferred embodiment of the present invention, best illustrated in Fig. 1, this computer product provides a communication facility 3 and means for communication 5 of the location of Private Server 14 on a computer network such as the Internet to Server Computer 12, as further described below. Said communication facility 3 can be provided with interfaces with a number of facilities 17 that generate data, in a manner well known to those skilled in the art, such as messaging facilities, monitoring facilities, database facilities and the like. As is explained below, the computer product of the present invention presents means for remotely accessing said data.

In another aspect of the computer product of the present invention an Internet Message Transfer Means 100 is provided that is adapted to process instructions received from the Mobile Client Device 31. The computer product of the present invention also uses the Internet Message Transfer Means 100 to send messages and data to the Mobile Client Device 31 for display to the user. In the preferred embodiment of the present invention, Internet Message Transfer Means 100 is configured to support an electronic mail protocol such as SMTP in accordance with the specifications of 2-way wireless pager network 102.

Internet Transfer Means 100 is dedicated to the functions of communication of messages, data and instructions between the Private Server 14 and Mobile Client Device 31.

In another aspect of the computer product of the present invention illustrated in Fig. 2., said Server Computer 12 is provided with a server computer product that communicates with said computer product dedicated to Private Server 14. Said server
computer product, illustrated in Fig. 1, provides a Registration and DNS Facility 6 or
means responsive to said means for communication 5 of the location of Private Server
14 for providing remote access to said Private Server 14, as explained below.

5 Private Messaging and Data Management Facility

In a second preferred embodiment of the present invention illustrated in Fig. 4,
said communication facility 3 further comprises a communication interface 7 and
communication software program 9 or Private Messaging and Data Management
Facility which are operably associated. Said Private Messaging and Data
Management Facility 9 comprises two principal elements, namely a Unified
Messaging Facility 20 and Data Management Facility 22.

As best illustrated in Fig. 5, the principal functions of Unified Messaging
Facility 20 are to receive and process messages of all types and content, including e-
mail, facsimiles, electronic voice mail, images, video data, executable program code,
audio data, formatted data or raw binary data. Unified Messaging Facility 20 is
operably associated with communication interface 7. The functions of
communication interface 7 are illustrated in Figure 6 for Fax/Voice/Data messages,
and in Figure 7 for e-mail.

As illustrated in Fig. 4, Unified Messaging Facility 20 further comprises E-
Mail Message Retrieval Facility 23, Voice Message Facility 25 and Fax Messaging
Facility 27, illustrated in Figs. 8, 9 and 10 respectively in operation in conjunction
with Remote Message Management Facility 29, the functions of which are explained
below.

In the present invention, Unified Messaging Facility 20 further comprises
Notification and Paging Facility 33. This facility is only initiated when a message is
received at Personal Server 14, in the manner described below in greater detail, from a
valid message originator. The hard disk of Personal Server 14 will store a copy of a
"Notification List" in co-operation with Notification Facility 33. The "Notification
List" contains the e-mail addresses, fax identifiers and/or caller identifiers of valid message originators. In the integration of the invention with a 2-way wireless pager network as described herein, in the preferred embodiment of the invention, a "NOTIFICATION" of the message receipt event is transmitted via the Internet 16 and 2-way wireless pager network 102 to the Mobile Client Device 31.

The principal functions of Data Management Facility 22 are: entering and retrieving database information, such as names, addresses, company information, personal information, contact history and the like; retrieving and displaying documents, including rendering the documents into a format more suitable for presentation to the user; and retrieving and displaying monitoring information such as video images captured by a surveillance camera.

In addition, the Unified Messaging Facility 20 and Data Management Facility 22, in co-operation with the system of the present invention, also provide the Remote Message Management Facility 29, as best illustrated in Fig. 5. The particular functions of the Remote Message Management Facility 29 are best illustrated in Fig. 11.

**Internet Registration and Location**

Said Server Computer 12 is configured, in a manner that is well-known, to be connected to the a network of interconnected computers such as the Internet, and particularly in a manner that accepts Internet requests and translates these requests into a connection between said Server Computer 12 and Private Server 14.

As best shown in Fig. 3, the system described herein further comprises a directory service program 28. In the particular embodiment illustrated herein, said directory service program 28 is operably associated with Server Computer 12. For the sake of clarity, said directory service program 28 can be either resident on said Server Computer 12 or remote from said Server Computer 12 but accessible therefrom. Directory service program 28 comprises a dynamic directory provided using a
protocol such as Domain Name Server (DNS) 6, with capability for dynamically modifying the directory content of the directory service program 28. It is desirable that only users of the present invention be given access to directory service program 28 for purposes of updating or changing the director information. Such access is provided in association with registration facility 19, as is described below.

As illustrated in Fig. 3, Private Messaging and Data Management Facility 9 comprises a Registration Routine 21 for indicating that Private Server 14 is available to accept messages from the Internet 16. It is desirable for such Registration Routine 21 to be engaged periodically for a number of reasons. First, it is desirable to verify that the Internet or server connection of Private Server 14 is active. Second, when the Private Server 14 is configured to provide the functions of this invention, registration with the Server Computer 12 is obviously required. Third, the Registration Routine 21 is required to be engaged periodically to update the directory service program 28 to address possible changes to Private Server’s Internet Protocol address. Fourth, from a system resource management point of view it may be desirable to restrict access to the Server Computer 12 to only active users, in which case users who according to pre-set parameters are determined to be inactive would be automatically de-registered after a period of time. Fifth, some users may wish to change their access codes from time to time. Sixth, some users may want to de-register temporarily with Server Computer 12 in order to interrupt receipt of communications from Server Computer 12, for example, during operation of a back-up routine at Private Computer 14. Seventh, Registration Routine 21 may be required to change security settings provided at Server Computer 12, in a manner that is well-known.

It should be understood that the present invention allows the parameters of the operation of the Registration Routine 21 to be set, in a manner well-known to those skilled in the art, by either the user or the system operator of Server Computer 12, as may be required.

The availability to accept communications such as messages of Private Server 14 is communicated by Registration Routine 21 by registering a name string or digit
string with the directory service program 28 that must not conflict with any other similar name in the dynamic directory associated with directory service program 28. This communication includes the current Internet Protocol address of Private Server 14 that as indicated above may change from time to time. The Internet Protocol address of Server Computer 12, however, is fixed and known to the system described herein.

In the manner described above, the current Internet Protocol address of Private Server 14 is provided from time to time and dynamically stored in directory service program 28.

When a Requesting Device 30, such as the Web browser illustrated in Fig. 1, or the Mobile browser illustrated in Fig. 2, requests a connection to Private Server 14, Requesting Device 30 first connects to Server Computer 12 in a manner that is well-known and indicates the name of the Private Server 14 to which Requesting Device 30 wishes to connect.

Server Computer 12 will validate the request to connect to Private Server 14 and initiate a search in the directory associated with the directory service program 28 to obtain the current Internet Protocol address of Private Server 14 and port number of message server 15 of Private Server 14. Server Computer 12 is thereby engaged to allow a connection to be set up between Requesting Device 30 and Private Server 14.

In the embodiment of the present invention illustrated herein, three connection methods are specifically provided for sake of illustration, as between the Requesting Device 30 and Private Server 14. First, a Direct Connection can be provided using a secure web protocol such as “https”, in a manner that is well known.

In this method, once Server Computer 12 has validated the connection request provided by Requesting Device 30, the Requesting Device 30 is simply forwarded to the Private Server 14, in a manner that is well-known. Thereafter, all interactions will
take place directly between the Requesting Device 30 and the Private Server 14 during the communication session.

Second, where the Server Computer 12 has network access to Private Server 14 but Private Server 14 is not accessible from the Internet 16, and may have a network address that is only valid within a network such as a Local Area Network, a Proxy Server (not shown) is used to provide the connection between the Requesting Device 30 or the Mobile Client Device 31 and Private Server 14, in a manner that is also well known.

In another aspect of this invention in which the Private Server 14 is integrated with a 2-way wireless pager network 102, when the Mobile Client Device 31 requests to send data to Private Service 14 via the 2-way wireless pager network 102, a Message Transfer Agent (not shown) which is a known SMTP network component is involved. In one preferred embodiment of the invention the Message Transfer Agent is associated with a wireless network gateway (not shown) that moves messages between the Internet and the 2-way wireless pager network 102. The Mobile Client Device 31 sends messages via the 2-way wireless pager network 102 to the wireless network gateway. The wireless network gateway will forward the messages to the Message Transfer Agent which will ask the Domain Name Server 6 or Server Computer 12 to look up the e-mail address and return the Internet (IP) address of the Private Server 14, in a manner that is well known.

When Private Server 14 requests to send data to the Mobile Client Device 30 via the Internet and via the 2-way wireless pager network 102, the Private Messaging and Data Management Facility 9 will transfer the data as a message to the Message Transfer Agent associated with the 2-way wireless pager network 102 in a manner that is well known. The 2-way wireless pager network 102 will convey the message to the Mobile Client Device 30 in a manner that is also well known.
The above-described connections provide the means for transferring three kinds of data. First, static page data, namely menus for navigation, which are provided in a manner that is well known to those skilled in the art. Second, lists of information such as message lists which are also provided in a manner that is well known. Third, streamed data, namely message content data such as voice, fax, text and video data which can be displayed in “Real Time” while it is being received. Fourth, notification data about messages and events received by the Private Server 14 and notifications of documents and other information managed by the Private Server 14. Fifth, instructions regarding operations that need to be performed by the Private Server 14 relating to said messages, events, documents and other information. Sixth, having regard to the integration of the Private Server 14 of the present invention with a 2-way wireless pager network 102 and document content and other information residing on the Private Server 14 that is to be presented to the user of the Mobile Client Device 30. Providing the function of the Private Messaging and Data Management Facility 18 requires access to all of the above kinds of data.

Mobile Client

In the particular embodiment of the present invention illustrated in Fig. 13, the Mobile Client Device 31 comprises a Mobile Communication Facility 301 that embodies the functionality of the communications between the Mobile Client Device 31 and the Private Server 14. The Mobile Communication Facility 301 comprises a Wireless Communication Interface 302 that performs the functions related to the interfacing with the 2-way wireless paging network 102 in a manner that is well known. The Mobile Communication Facility 301 further comprises a Preferences Management Facility 304 which is an optional facility that is used to display, set and update user preferences both for the Mobile Client Device 30 and for the remote Private Server 14. The Mobile Communication Facility 301 still further comprises the Mobile Device Private Message and Data Management Facility 303 which receives notifications and data sent by the Private Server 14, and whose functionality is described more fully below.
The Mobile Device Private Message and Data Management Facility 303 provides three functions. First, it comprises a Notification Display Facility 306 which receives notification from the Private Server 14 of messages, documents and other information residing on Private Server 14 and displays such notifications to the user of the Mobile Client Device 31 in a manner that is well known. Second, Mobile Device Private Message and Data Management Facility 303 comprises Command Operation Facility 307 which provides means whereby the user can issue commands to the Private Server 14 to perform actions and operation on the data under the management of the Private Server 14 and opening a document managed by the Private Server 14. Third, Mobile Device Private Message and Mobile Data Management Facility 303, further comprises Data Display Facility 305 which provides means for displaying data opened and received by the Mobile Client Device 31 from the Private Server 14. This data may include, but is not limited to, textual message information, document information, graphical information and images.

Security

It is desirable to use a secure communication protocol between the Private Server 14 and either the Requesting Device 30 or the specific Mobile Client Device 31 and the Private Server 14. Message payloads between these respective entities should be encrypted using secure encryption techniques in a manner that is well known. It should be understood that the use of other means of providing secured communication between electronic devices in association with the system described herein are contemplated by the present invention.

Where Requesting Device 30 is a WAP device, it should be understood that authentication and connection to Private Server 14 can happen “automatically”. This is because a unique identifier is generally allocated to each WAP device by the manufacturer. As part of the Registration Routine 21 described above, this unique identifier can be associated with the current location of Private Server 14 thus forwarding the WAP device to Private Server 14 automatically.
Full Internet Access

The system provided in this invention allows “full” Internet access to the functions of the Private Messaging and Contact Facility 9 in particular, by operation of the Remote Message Management Facility 29 of the present invention and the Data Management Facility 22, as described above.

This “full” Internet access to data associated with Private Server 14, such as message and is best understood by illustration of examples in operation.

The user is able to access the list of messages stored on Private Server 14 in association with the computer product of the present invention, and to command Private Server 14 to initiate a connection to receive messages from external message stores (e.g. an Internet Service Provider managing a specific e-mail account).

More importantly, the invention provided herein allows such user to access said list of messages (of any type) stored on Private Server 14 via a Web browser program running on another computer attached to the Internet and command Private Server 14 to initiate a connection to receive messages from external message stores.

The present invention also allows a user to access said list of messages via a telephone call to Server Computer 12 by means of suitable telephony hardware and to command Private Server 14 to initiate a connection to receive messages from said external message stores.

Similarly, the present invention will allow the user to access said list of messages and to command Private Server 14 to initiate a connection for user to receive messages from external message stores via a Mobile Wireless (WAP) device.

On command from the user, the present invention allows individual voice messages to be played; individual e-mail messages, facsimile messages, video and
other images to be displayed on a computer, cellular phone (depending on hardware resources) or WAP-enabled hand-held computer; and individual executable message content to be executed on Private Server 14 (for example execution of a sound file and transmission of audio stream to the user).

The present invention also allows the user to reply to a message by means of voice message that is sent as an e-mail attachment when the connection to Private Server 14 is a voice connection. The present invention further allows the user to reply to a message by means of a text message.

By means of Notification Facility 33 in particular, the present invention is able to notify the user of new received messages by means of a telephone call to a Wireless paging service specified by the user. Private Server 14 is also able to notify the user of new received messages by means of a telephone call to a telephone number specified by the user and the subsequent playing of a voice message as a voice data stream. Private Server 14 is further able to notify the user of new received messages by means of a message sent over the Internet to a Wireless paging service specified by the user. Private Server 14 is still further able to provide means for remotely adding, modifying and deleting entries to the Notification List provided by Notification Facility 33 via a Web browser program running on another computer attached to the Internet, voice telephone call to the telephone line attached to Private Server 14 by means of a modem, or Mobile wireless (WAP) device.

As is illustrated in the Figures, and in particular Figures 8, 9 and 10, the computer product of the present invention incorporates text-to-speech technology to provide the full Internet access described herein to a user having a telephone line. This text-to-speech can comprise a variety of commercially available technologies, implemented in a manner that is well known.

The Data Management Facility 22 of the present invention contributes to providing full Internet access to message and contact management. By means of such facility, the present invention allows the user to access data contained in the contact
database on the local computer associated with the Data Management Facility 22, as
illustrated in Fig. 11). More importantly, the present invention also allows the user to
access said data on a local computer via a Web browser program running on another
computer attached to the Internet and to command Private Server 14 in association
with the computer product of the present invention to initiate a connection to receive
messages from an external message address. In addition, the present invention allows
a user to access said data on a local computer via a telephone call to the telephone line
attached to Server Computer 12 by means of a suitable telephony hardware device, or
via a Mobile wireless (WAP) device.

In a further illustration of the present invention an example in operation is
provided wherein the Private Server 14 of the present invention is integrated with a 2-
way wireless pager network 102.

By means of Notification Facility 33, the present invention provides means to notify a
user having received new messages, documents or other data over the Internet to the
2-way wireless paging network 102.

The user is able to access the list of messages stored on Private Server 14 in
association with the computer product of the present invention, and to command
Private Server 14 to initiate a connection to receive messages from external message
stores (e.g. an Internet Service Provider managing a specific e-mail account).

On command from the user by operation of the Command Operation Facility
307 and Data Display Facility 305, the present invention allows individual voice
messages to be played, individual e-mail messages to be displayed, e-mail and
facsimile messages to be forwarded to a fax machine and forwarded to an external e-
mail account. The present invention also allows the user to reply to a message by
means of text e-mail or as a generated voice message (by using a text-to-speech
facility) that is sent as an e-mail attachment.
The present invention and in particular Mobile Device Private Message and Data Management Facility 303 also allows the user to access the list of documents and files stored on the Private Server 14 and to display the list to the user. The present invention further allows the user to forward documents as e-mail or facsimile messages or to open a document such that it may be viewed on the Mobile Client Device 30 in co-operation with the Data Display Facility 305.

The present invention also allows a user to access said list of messages via a telephone call to Server Computer 12 by means of suitable telephony hardware and to command Private Server 14 to initiate a connection to receive messages from said external message stores.

As is illustrated in the Figures, and in particular Figures 8, 9 and 10, the computer product of the present invention incorporates text-to-speech technology to provide the full Internet access described herein to a user having a telephone line. This text-to-speech can comprise a variety of commercially available technologies, implemented in a manner that is well known.

Other variations and modifications of the invention are possible. In particular a number of computer program facilities are described in this invention as separate facilities for the sake of describing the invention. However, it should be understood that such facilities can be combined with other facilities comprising the present invention, or such facilities can be sub-divided into separate facilities. It should also be understood that various other features or functions can be added to the present invention without departing from the scope of the present invention such as additional means accessing and managing messages and contact information remotely. In addition, it should be understood that the private communication portal can be associated with any means for generating useful data and managing such data where it is desirable to provide remote access to such data in the manner specified herein. In addition, it is contemplated that various means for restricting access to the private communication portal of the present invention other than to authorized users be utilized. It should also be understood that the Private Server of the present invention
may comprise more than one copy of the computer product of the present invention. Various means for creating network connections are illustrated herein, however, other means for creating such connections used in conjunction with the invention described are also within the scope of the present invention. All such modifications or variations are believed to be within the sphere and scope of the invention as defined by the claims appended hereto.
CLAIMS

WE CLAIM:

5 1) A system for providing a private communication portal for a user comprising:
   a) a first computer comprising a communication facility wherein said first
      computer is associated with a network of computers; and
   b) second computer comprising a locating facility for locating said first computer
      wherein said second computer is associated with said network
      wherein said locating facility is responsive to a third computer for locating said first
      computer for communication between said first computer and a third computer;
      and wherein said private communication portal provides a private server at said first
      computer.

15 2) A system as claimed in claim 1, wherein said first computer further comprises a
    database and said system provides means for remotely accessing said database.

20 3) A system as claimed in claim 2, wherein said communication facility further
    provides means for setting the communication settings of said communication
    facility, and said system provides means for setting said communication settings
    remotely.

25 4) A system as claimed in claim 1, wherein said locating facility comprises means
    for making the current location of the first computer known to the second
    computer.

30 5) A system as claimed in claim 4, wherein said locating facility comprises:
    a) means for communicating the current location of the first computer provided
       by said communication facility; and
b) means responsive to said means for communicating the current location of the first computer provided by said second computer.

6) A system as claimed in claim 5, wherein said second computer further comprises a dynamic location directory associated with said locating facility, wherein said dynamic location directory provides means for providing the location of said first computer on said network and means for updating said location to provide the current location of said first computer on said network to said third computer.

7) A system as claimed in claim 6, wherein said locating facility updates said current location periodically.

8) A system as claimed in claim 7, wherein said system further comprises a security facility for restricting access to said communication facility to said user only.

9) A system as claimed in claim 8, wherein said communication facility further comprises a communication interface for sending and receiving data communications.

10) A system as claimed in claim 9, wherein said communication facility interfaces with data generating facilities to provide data generated by said data generating facilities at said third computer.

11) A system as claimed in claim 9, wherein said communication facility further comprises a unified messaging facility for processing and managing messages in co-operation with said communication interface.

12) A system as claimed in claim 11, wherein said communication facility further comprises a contact information facility.

13) A system as claimed in claim 12, wherein said communication facility further comprises a remote message management facility.
14) A system as claimed in claim 13, wherein said remote message management facility provides means for reading, replying to and managing said messages remotely.

15) A system as claimed in claim 14, wherein said remote message management facility is provided by said unified messaging facility and contact information facility in co-operation.

16) A system as claimed in claim 15, wherein said messages comprise e-mails, facsimiles or voice mails.

17) A system as claimed in claim 16, wherein said system permits use of said unified messaging facility using existing telephone and fax numbers, and e-mail addresses.

18) A system as claimed in claim 16, wherein said unified messaging facility comprises an e-mail message facility.

19) A system as claimed in claim 18, wherein said unified messaging facility further comprises a fax message facility.

20) A system as claimed in claim 19, wherein said unified messaging facility further comprises a voice message facility.

21) A system for providing a private communication portal for a user comprising:
    a) a first computer associated with a network of computers comprising:
       i) a microprocessor;
       ii) communication interface; and
       iii) computer program operably associated with said microprocessor, said computer program comprising:
           (1) a communication facility; and
(2) means for communicating the current location of said first computer in
association with said communication interface;

b) second computer associated with said network by means of a permanent
network address comprising:

i) a microprocessor;

ii) communication interface; and

iii) locating facility associated with said communication interface and
microprocessor for locating said first computer on said network, said
locating facility being responsive to said means for communicating the
current location of said first computer;

wherein said locating facility is responsive to a third computer for locating said
first computer and said second computer facilitates a communication session
between said communication facility of said located first computer and third
computer;

and wherein said private communication portal provides a private server at said
first computer.

22) A system as claimed in claim 21, wherein said private server further comprises a
database, and said system provides means for accessing said database remotely.

23) A system as claimed in claim 22, wherein said communication facility provides
means for setting communication settings for said communication facility, and
said system provides means for setting said communication settings remotely.

24) A system as claimed in claim 23, wherein said second computer further comprises
a dynamic location directory associating with said locating facility, wherein said
dynamic location directory provides means for providing the location of said
private server and means for updating said location to provide the current location
of said private server on said network.

25) A computer product for providing a private messaging portal at a first computer
comprising a microprocessor and communication interface, wherein said first
computer is connected to a network of computers, said computer product comprising:
a) a communication facility; and
b) means for communicating the location of said first computer on said network
to a second computer connected to said network at a permanent network address, in co-operation with said communication interface and communication facility so as to locate said first computer on said network for communication with a third computer;
wherein said communication facility is responsive to said second computer for establishing a communication session with said third computer once said location of said first computer is provided to said second computer;
and wherein said private communication portal provides a private server at said first computer.

26) A computer product as claimed in claim 25, wherein said first computer further comprises a database and said computer product provides means for remotely accessing said database.

27) A computer product as claimed in claim 26, wherein said communication facility further provides means for setting the communication settings of said communication facility, and said computer product provides means for setting said communication settings remotely in association with said microprocessor and communication interface.

28) A computer product as claimed in claim 27, wherein said locating facility comprises means for making the current location of the first computer known to the second computer.

29) A computer product as claimed in claim 28, wherein said locating facility comprises:
a) means for communicating the current location of the first computer provided by said communication facility; and

b) means responsive to said means for communicating the current location of the first computer provided in association with said second computer.

30) A computer product as claimed in claim 29, wherein said computer product provides at said second computer a dynamic location directory associated with said locating facility, wherein said dynamic location directory provides means for providing the location of said first computer on said network and means for updating said location to provide the current location of said first computer on said network to said third computer.

31) A computer product as claimed in claim 30, wherein said locating facility updates said current location periodically.

32) A computer product as claimed in claim 31, wherein said computer product further comprises a security facility for restricting access to said communication facility to said user only in association with said second computer.

33) A computer product as claimed claim 32, wherein said communication facility further comprises a communication interface for sending and receiving data communications.

34) A computer product as claimed in claim 33, wherein said communication facility interfaces with data generating facilities to provide data generated by said data generating facilities remotely.

35) A computer product as claimed in claim 33, wherein said communication facility further comprises a unified messaging facility for processing and managing messages in co-operation with said communication interface.
36) A computer product as claimed in claim 35, wherein said communication facility further comprises a contact information facility.

37) A computer product as claimed in claim 36, wherein said communication facility further comprises a remote message management facility.

38) A computer product as claimed in claim 37, wherein said remote message management facility provides means for reading, replying and managing said messages remotely.

39) A computer product as claimed in claim 38, wherein said remote message management facility is provided by said unified messaging facility and contact information facility in co-operation.

40) A computer product as claimed in claim 39, wherein said messages comprise e-mails, facsimiles or voice mails.

41) A computer product as claimed in claim 40, wherein said computer product permits use of said unified messaging facility using existing telephone and fax numbers, and e-mail addresses.

42) A computer product as claimed in claim 40, wherein said unified messaging facility comprises an e-mail message facility.

43) A computer product as claimed in claim 42, wherein said unified messaging facility further comprises a fax message facility.

44) A computer product as claimed in claim 43, wherein said unified messaging facility further comprises a voice message facility.

45) A computer product for use in association with a server computer for facilitating a private messaging portal dedicated to a remote computer, wherein said server
computer and remote computer are connected to a network of computers, said computer product comprising:

a) a communication interface;

b) authorization facility;

c) locating facility associated with said communication interface for receiving the current location of said remote computer and storing said current location into a directory at said second computer;

wherein said communication interface receives requests from a third party computer for communication with said remote computer;

wherein said authorization facility determines whether said third party computer is authorized for communication with said remote computer;

wherein said communication interface initiates a communication session between said remote computer and third party computer authorized for communication with said remote computer;

and wherein said computer product provides in co-operation with said private communication portal a private server at said remote computer.

46) A method of providing a private communication portal at a first computer wherein said first computer is associated with a network of computers, said method comprising

a) providing said first computer with a communication facility wherein said communication facility provides means for communicating the current location of the first computer to a server computer associated with said network;

b) providing said server computer with a locating facility for locating said first computer, wherein said locating facility is responsive to said means for communicating the current location of the first computer;

c) storing said current location into a directory associated with said locating facility;

d) facilitating communication between said first computer and a third computer by means of said locating facility by authenticating said third computer for
communication with said first computer and locating said first computer and establishing a communication session between said first and third computers.

47) A method as claimed in claim 46, further comprising updating said current location periodically by means of said locating facility.

48) A method as claimed in claim 47, further comprising providing an interface between said communication facility and data generating facilities so as to provide remote access to data generated by said data generating facilities by means of said communication facility.

49) A method as claimed in claim 47, wherein said first computer is provided with a unified messaging facility, further comprising the step of accessing said unified messaging facility remotely.

50) A method as claimed in claim 49, wherein said first computer is also provided with a contact information facility, further comprising the step of accessing said contact information facility remotely.

51) A method as claimed in claim 50, further comprising the step of accessing and managing, voice mails, fax messages and e-mail messages remotely using said unified messaging facility and contact information facility.

52) A method as claimed in claim 50, further comprising the step of setting the communication settings of said unified messaging facility remotely.

53) A system for providing a private communication portal for a user comprising:
   a) a first computer comprising a communication facility wherein said first computer is associated with a network of computers;
   b) a second computer comprising a locating facility for locating said first computer wherein said second computer is associated with said network of computers; and
c) an Internet message transfer means located at said first computer and connected to said communication facility for receiving and processing instructions from a pager network

wherein said locating facility is responsive to a third computer for locating said first computer for communication between said first computer and a third computer;

wherein said private communication portal provides a private server at said first computer;

and wherein said Internet message transfer means is adapted to permit remote activation of said communication facility in response to said instructions from a pager network.

54) A method of implementing a private communication portal comprising:
   a) providing a first computer comprising a communication facility;
   b) providing the first computer with an Internet message transfer means for receiving and processing instructions from a pager network;
   c) connecting the first computer with a network of computers;
   d) providing a second computer comprising a locating facility for locating said first computer wherein said second computer is associated with said network of computers; and
   e) processing said receiving and processing instructions from the pager network to remotely activate said communication facility in response to said instructions from the pager network.
Figure 4

- Personal Server
- Microprocessor
- Communication Interface
- Communication Facility
- Private Messaging and Contact Facility
- Registration Routine
- Unified Messaging Facility
- Contact Information Management Facility
- Remote Message Read/Reply Management Facility

SUBSTITUTE SHEET (RULE 26)
Telephone line is idle and ready to receive calls.

A call comes in. The call detection mechanism detects if this is a voice call, a fax call, or a data call.

If call is from a data modem?

- Yes: Switch to data communication mode. [This is an optional feature].

- No: Call is from a fax machine?

  - Yes: Enter Fax mode and Receive Fax.

  - No: Assume this is a voice call. Run voice scripts.

If call is a fax machine?

- Yes: Enter the management options?

  - Yes: Go to: Remote messages reading/replying and management (Figure 12).

  - No: Auto-forward to another fax?

    - Yes: Forward the fax to the designated fax number.

    - No: Auto-forward to another e-mail?

      - Yes: Forward the fax message as a graphics attachment to the designated e-mail address.

      - No: Call the designated phone number and follow Voice messages management (Figure 9) for voice and Fax messages management (Figure 10) for fax.

If auto-forward to another e-mail?

- Yes: Forward the voice message as audio mail attachment to the designated e-mail address.

- No: Sender in notification list?

  - Yes: Pager/SMS notification?

    - Yes: Re-direct the message to a pager or SMS device.

    - No: Call the designated phone number and follow Voice messages management (Figure 9) for voice and Fax messages management (Figure 10) for fax.

If auto-forward to another e-mail?

- No: Voice message recorded successfully?

  - Yes: Auto-forward to another e-mail?

    - Yes: Forward the voice message as audio mail attachment to the designated e-mail address.

    - No: Call the designated phone number and follow Voice messages management (Figure 9) for voice and Fax messages management (Figure 10) for fax.
Figure 7

The system periodically checks the user’s e-mail account(s). It is up to the user to preset which account(s) to check and the interval between checking.

New messages?

Yes

Auto-forward to fax?

No

Yes

Convert to fax format and send to the designated fax number.

Auto-forward to another e-mail?

No

Yes

Forward the message to the designated e-mail address.

Sender in notification list?

No

Yes

Pager/SMS notification?

No

Yes

Call the designated phone number and E-mail messages management(Figure 8).

Telephone notification?

Yes

Re-direct the message to a pager or SMS device.

No
Access and play the first message in the list. Use text-to-speech technology to convert the sender's name, subject, and the message body into a voice message.

The caller now has an option: listen again, reply to the sender, redirect the message to a fax machine, redirect the message to another e-mail address, mark as read or read the next one.

- **Reply to the sender?**
  - Yes: Record a voice message and package the message as a self-playing executable file. Send the file as an e-mail attachment back to the sender.
  - No:
    - **Redirect to a fax machine?**
      - Yes: Convert the message to fax image(s) and send to the specified fax machine number.
      - No:
        - **Re-direct to other e-mail address?**
          - Yes: Forward the message to the specified e-mail address.
          - No:
            - **Re-direct to a phone number?**
              - Yes: Forward the message as a voice message to the specified telephone number.
              - No:
                - **Mark the message as old?**
                  - Yes: Mark the message as an old message.
                  - No:
                    - **Read next message?**
                      - Yes: Prepare to read the next message in the list of available new messages.
                      - No: Finish

- **Read it again?**
  - Yes: Read it again
Figure 9

Access and play the first message in the list. Use text-to-speech technology to convert the sender's name and message subject into a voice prompt.

The caller has an option to: listen again, reply to the sender, redirect the message to a fax machine, redirect the message to an e-mail address, mark as read, or read the next one.

Reply to the sender?  Yes  
No

Redirect to a fax machine?  Yes
No

Redirect to other e-mail address?

Redirect to a phone number?

Mark the message as old?

Read next message?

Record a voice message and package the message as a self-playing executable file and send the file as an e-mail attachment back to the sender.

Using speech recognition technology to convert the message to image(s) and send to the specified fax machine.

Forward the message to the specified e-mail address.

Forward the voice message to the specified telephone number.

Prepare to read the next message in the list of available new messages.

Mark the message as an old message.

Finish

Read it again?

Yes

No
Access and play the first message in the list. Use Optical Character Recognition (OCR) and text-to-speech technology to convert the fax message into a voice message.

The caller has a

Reply to the sender?

Yes

Record a voice message, convert it to text and then to a fax image and send it back to the caller’s fax number.

Redirect to a fax machine?

Yes

Send the fax images to the specified fax machine.

Redirect to an e-mail address?

Yes

Send the fax images as e-mail attachments to the specified e-mail address.

No

Mark the message as old?

Yes

Mark the message as an old message.

No

Read next message?

Yes

Prepare to read the next message in the list of available new messages.

No

Finish

Read it again?

Yes
Search for a contact by using the telephone keypad DTMF tones or Speech Recognition to enter the first few characters of the name.

Found in the database?

Yes

Caller can send a message to the found contact, or by means of Text-to-speech, listen to more contact information.

Send an e-mail?

Yes

Send a voice message?

Yes

Record a voice message and convert it to text or package the voice message as a self-running executable file and send the file as e-mail attachment to the e-mail address recorded in the contact database.

No

Listen to other information?

Yes

Read the detail contact information using Text-to-Speech.

No

Send a voice message?

Yes

Record a voice message and send it to the selected contact phone number.

No

Finish

SUBSTITUTE SHEET (RULE 26)
Authentication successful?

Yes

No

Finish

After verifying the user ID and password, the caller has an option to read/reply to e-mail, fax, and voice messages, access the contact database and/or to send messages.

Read e-mail, voice, or fax messages?

Yes

Go to the Message Management Facility (Figures 8,9,10).

No

Access the contact database?

Yes

Go Remote contact database accessing (Figure 5).

No

Check e-mail now?

Yes

Connect to the e-mail server and retrieve any new e-mail messages from the mail server.

No

Other services?

Yes

Effect configuration changes. E.g. changing the notification or forwarding parameters.

No

Caller terminated the session?

Yes

Finish

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