SYSTEM AND METHOD FOR EXCHANGING DATA IN A NETWORK

The present invention relates to a system and method for data exchange in a network according to the preamble of claims 1 and 9.

Already known in the state of the art, are systems and methods for data exchange in networks.

For example, PCT Publication WO96/03896 describes an information system having a data storage unit which is connected by means of a message transmission path to subscriber stations. Summary information concerning the information data stored in the data storage unit are automatically transmitted to subscribers who can retrieve thereafter the selected information. In this way, the on-line database serves in a first place as a data storage unit for preparation of data for retrieving by data searcher clients, in which these clients can merely select from offers already available in the database.

European Patent Application publication 0370164 A1 describes an interactive market management system in which several sellers and buyers can be connected by means of a network database directly with one another.

Furthermore, PCT Publication WO95/12176 discloses an information processing system for finding information using a computer network in which a broker can have access to several databases. Using this system, the broker can manually search targeted offers from data suppliers upon request of a data searcher, and present offers to the data searcher or buyer.

European Patent Publication EP 0639018 A2 discloses a system for data transmission. Information data is sent or received between a sender and a receiver in accordance with a selection by time in specific time windows.

Further methods for data exchange are, for example, illustrated in U.S. Patent No. 5,392,336, PCT Publication WO95/10913 and European Patent Publication EP 0,176,522 A as well as German Patent Publication DE 3122348.

Within the context of this state of the art, it is an object of the present invention to provide a system and a method for data exchange in a network which provides, in response to a specific data request or query sent to a central server, a complete and easily evaluated result both

quickly and reliably and which concretely answers the request. The data exchange should proceed in accordance with the invention as automatically as possible.

This object is achieved by a system and a method for data exchange having the characteristics of claims 1 and 9. Advantageous embodiments are described in the depending claims.

An advantageous embodiment of the system for data exchange in a network includes at least one central server having a data storage unit which is provided with a data input connection and data output connection and has at least one client and one data provider for input and/or retrieval of data information into or from the data storage unit of the central server. According to this embodiment of the invention, the server comprises a module for automatic relaying of the client request to the selected provider. A hardware/software apparatus for control of the internal circuitry processes of the server are designated as the module. The automatic selection of the information supplier or provider is achieved according to the invention depending on the client request, i.e. for example, the server queries the database in response to client request for requested data information and the server only forwards to the located database the client's request. In this way, a large of number of possible providers are quickly and easily as well as reliably reached.

In accordance with a preferred embodiment, the data information requested by the client (data searcher) relate to offers or quotes for particular products or services. In this way, a data provider is prompted to submit an offer in case a data searcher wants offers for a particular product or service.

Yet, another advantageous embodiment provides a server having a module for anonymous or secure relaying of data requests of a client to a data provider so that the selected data provider receives no information about the client. In this way, the data provider, for example receiving a request by facsimile, is compelled to use the type of communication preferred by the system (for example using an entry in a web page).

Furthermore, according to an advantageous embodiment of the invention, it is provided that the requests are relayed by the server to providers selected according to region. Thereby a further possibility of control is provided by the information system. For example,

consideration of regionally different general quality standards of the suppliers can be taken into consideration.

While the invention provides a notification of a data provider, if a client request remains unanswered after a predetermined time, it is guaranteed that all clients targeted with information are taken care of. The data supplier or provider concerned is made aware by notification of the availability of a data searcher (client) in a reliable manner, and the data provider is signaled to transmit the desired data information to the client. The time spent until a new notification is made can either be preset by the system or selected by the client. Using heuristic statistics available in a server, providers which only rarely or never respond to request can be eliminated from the information on further offer requests.

The system according to the invention is particularly advantageously applied as a sales promotion system. The data storage unit is supplied by providers with product or service information in a known way via conventional information transmission devices such as for example, TV decoders of an interactive television, facsimile transmission devices, personal computer (PC) and modem combinations, PC/ISDN devices or other subscriber terminal devices of conventional data networks. The information to be stored in the data storage unit consists of for example current price and product information, technical data, company information and sales and trade information using on-line connections to further constituent databases, the data supplier or provider can enhance its data information with additional information important to a potentially interested party or prospective customer. The data information can thus be linked, for example, with advertisements, editorial articles, test reports and further information of interest. Since the data provider has compiled the data information to be recorded in the data storage unit, the provider transmits the data to the data storage unit. This takes place for example in a known way via existing telephone, ISDN or Datex networks or the like.

A further advantageous embodiment of the invention provides that the server comprises a module for automatically converting and formatting data. This allows for example the conversion of an e-mail message of the client into a fax or HTML format so that the request from an information provider can be received which uses these data formats.

Furthermore, it is advantageous that the server is connected with external data bases from which additional information can be queried. These external databases can be further product specific databases or information and trade databases as for example, Creditreform (TM) or Dunn and Bradstreet (TM), customs databases, etc. The method for data exchange in a network comprises at least one client (data searcher), a central server and a data provider, in which the method comprises the following steps:

1. Sending a data query or request of a client to the central server.
2. Generating a list of possible providers from a provider pool by the server depending on the data in the query.
3. Establishing a connection and transmission of the data query to possible data providers using simultaneous transmission of a network address for the reply.
4. Receiving the desired data from at least a fraction of the possible data providers from the central server.
5. Collecting the desired data information or data partial information by the central server and forwarding to the client.

The network may comprise for example the Internet. The control of the essential process steps is carried out by central server, which comprises, in addition to corresponding access software for the on-line service, a database, for example an SQL-database, and filters for the conversion of various data format. Furthermore, the server is prepared to establish automatic connections with data service providers.

First, a client or data searcher establishes an on-line connection with the central server and transmits a data query. The data query is carried out using for example a suitable terminal program or an Internet browser. The data query can be for example a query for wares or goods specified according to product type or product.

Using the data query of the client or data searcher, the central server generates a list of possible providers by linking the search terms with index terms. In the case of automatic retrieval, the requested data or product can be compared with the product descriptions or designations listed in a server such as search terms. The listed product designations are linked with provider addresses in the address list. If no match between the requested and listed product designation is found, the server then looks in the product group containing the requested product. If no

match is also found in t his case, then all product providers are queried. The process involved is thus a heuristically working intelligent list generation. The advantage is that the probability of negative answers to a data query is limited, i.e. the data search is optimized. During the automatic generation of the provider list, the type of communication according to the possibilities of the data provider is chosen, that is if the data provider has no E-mail address, a fax for example is sent. According to the method, the data query is transmitted, and simultaneously a network address of the central server is given for the response. In this way, the data query can either concretely be specified, or only roughly defined and only completed when the provider responds.

The desired data is then communicated from the data provider and transmitted to the network address of the central server. In the case of automatic offer retrieval, the desired data comprises the offers or bids for the requested products. The central server collects the information output from individual data providers and compiles the data in a form readable by the data searcher or client. In the case of offer fetching, a sorting, for example, by price, can also take place. Finally, the data information processed in this way concerning various data providers is forwarded to the client by E-mail, fax or in an agreed upon standard format.

It is an advantage of the described method that the client (data searcher) submits merely a single query and as a result automatically obtains the reply of a number of data providers.

The method can also be carried out with several clients, servers and data providers at the same time.

A further advantageous embodiment of the method of data exchange provides that the client sets a time limit for the preparation of the data information such that the server no longer accepts any new data information after expiry of the time limit and the data information already received is forwarded to the client. The time limit set by the client is forwarded with the data request or query from the server to the possible data suppliers or providers and the network address for the reply for receipt of further data information is cut-off after expiry of the time limit. The data information is then compiled within a short time automatically by the server and forwarded to the client in a standard

format. In this way, the data searcher (client) can receive and compare within a short time period a large number of data information from various data providers. This is, for example, in the case of invitations for tenders to purchase goods having rapidly changing prices.

Furthermore, an advantageous embodiment of the invention provides that the data information is recorded in the virtual web page automatically generated by the server. In this way, each data provider is provided with an individual virtual web page for submitting the provider's offer. The individual password of each individual data provider is at the outset positively requested upon selection of the network address of the server by the data providers. Each individual data provider is then connected with its individual home page. The submission of offers is always achieved without a data provider seeing the offers of other data providers.

A further embodiment of the invention provides that receipt and processing of data queries proceeds at the data provider end like registration of the data information in the web page by an automatic process for example a mail robot. By a mail robot is understood a program controlled computer which processes queries that have been received according to a predetermined algorithm and answers them automatically in a standardized form. The method and thereby be automated to the degree that the mail robot (and thereby the data provider) retrieves independently data queries from the central server (i.e. receives) and answers them. This requires that the data provider has a standardized interface to the central server and that all required information, as for example product item number, client number, time limit, password, and network address are transmitted in a standardized form.

Furthermore, several central servers can be provided in the network in which the central service are synchronized among each other. In this way, a quicker access to the nearest central server is assured and the access to the data information of data providers is possible worldwide.

Furthermore, an advantageous embodiment provides the application of a user interface for offline generation of data queries from data searcher

for sending to the central server. In this way, the comparison and calculation of incoming data information are immediately possible.

Finally, the described method is suited advantageously for application in automatic retrieval of offers for goods, wherein product index numbers are generated by the server in addition to the listed product designations. This takes place in the background by means of a numeric table (matrix), which stores and manages product numbers. Within the matrix, various product numbers of various providers designating however the same articles are linked and indexed, that is a server product index number is assigned. In order to be able to accept new items in the matrix and managed existing items, the matrix is automatically structured and expanded. This takes place by "intercepting" new provider product numbers which are for example included in submissions for offers for alternate or successor items. When the retrieval of the offer indicates, the various product numbers, of data requesters and various providers for one and the same product are linked with the same product numbers (indices) in the central server. The method steps are thereby easier to automate since the correct product numbers of the provider can be specified when requesting to receive data (for example using a mail robot) using automatic processes installed by the provider.

In the following, embodiments of the present invention will be described with reference to the attached drawings, in which:

Figure 1 illustrates schematically an embodiment of the system for data exchange according to the invention; and

Figure 2 shows the flow of a process according to the invention for automatic offer retrieval in a network.

A system for data exchange in a network illustrated schematically in Figure 1 comprises a server 10 including a data storage unit, which is organized like a structured interactive database. In the data storage unit, information data concerning data providers 20 can be stored. The stored data information is retrievable by clients (data searchers) 30. Providers 20 and data searchers 30 are connected by means of a message transmission path 40 with the data storage unit. Suitable message

transmission paths are for example the telephone network, ISDN network, data networks and cable television networks.

The data storage unit comprises an I/O unit module illustrated in Figure 1 with which the data storage unit is connected to the various message transmission 40. The providers 20 and data searchers 30 can be connected by means of any freely selected message transmission path 40 to the data storage unit. They are also equipped with the corresponding terminal apparatus, as a PC Modem 41 or ISDN connection 42, a network interface 43, a fax apparatus 44 or a TV decoder and television apparatus 46. The server 10 converts the data information available in the data storage unit in a particular format into the format required by the subscriber or for transmission to the subscriber. The server also has a verification device which checks authorization codes sent from subscribers so that only authorized subscribers have access to the data storage unit.

A data searcher 30 has access to the data storage unit as shown in Figure 1 using is terminal equipment 41 to 46 and the message transmission path 40 can there retrieve data information. The data information may comprise for example offers for specific products or services, which have been previously loaded by providers 20 in the data base. The data searcher or client 30 inputs a query to the database to find out more about further information regarding the earlier input offer of the provider 20. Alternatively, a data searcher 30 can however input also a query for a particular product or a service, without referring to a previously input offer of the provider 20 or without offers of the provider having been previously input. The server relays the query of the data searcher 30 to the terminal devices 41 to 44 of the providers 20 wherein the query is relayed only to those providers which offer the related product or the related service. The selection of the providers 20 can be done in an anonymous or secure manner, i.e. the data searchers 30 receive no information concerning the providers 20 during this selection. In this case, the data searchers 30 do not discover the identity of the providers 20 until the providers 20 have sent back an answer to the data searcher 30.

Furthermore, the selection according to geographical location of the provider 30 can be carried out. The selected providers 20 can then input in the data storage unit the data information requested by the data searcher 30 as a result of the transmission of the query of the data searcher 30 by means of the terminal devices 41 to 44 of the providers 20. The data storage unit forwards the data information to the requesting data searcher 30. If a request stored in the end terminal device 41 to 44 of a provider 20 is not answered before a predetermined amount of time has elapsed, while the provider 20 has responded to it and transmitted the requested data information to the interested requester 30, then the concerned provider 20 is automatically notified. In this way, either a screen output or a message stored in the server can be used. The provider 20 will be made aware by this notification in a reliable manner of the availability of a query or request concerning the provider 20 submitted by a data searcher 30.

The method according to the invention will now be described with reference to Figure 2.

The client searches for the best offer for an item which he or she more precisely specifies in his or her request or query for an offer. Additionally, the client can input data or restrictions concerning the offer to be retrieved of the product providers to be considered. Furthermore, the client or customer can specify the type of offer reply, namely for example, by e-mail, and the corresponding data structure for the reply when requesting the offer, as well as a time limit for the subsequent receipt of the offers. The client is connected by a network with the central server where the offer request is received and is processed immediately by a decision subroutine. The decision subroutine then checks whether the specifications set out in the offer request can be used to directly generate an address list, or whether a corresponding address list can be generated using a heuristic approach. In the case of an offer request, for example looking for a 386-SX chip as a product, when there is a failure to find a match between the chip searched for and the products found in the product list, then products from the next higher level are located, in this example the product group of CPU providers or resellers, and the addresses listed in that group are copied to generate the desired address list.

After generating the address list, the number of possible product providers is then known, and therefore so is also the corresponding number of passwords to be distributed. The passwords are distributed with the offer request to the corresponding product providers and a corresponding number 'n', from the number of possible providers, of virtual Web pages are prepared by the server. The offer request is forwarded to each of the product providers using the selected communications type, i.e. by fax or e-mail along with the additional information concerning the time limit, the individual password and the network address for the individual web page.

A password query take place when the network address is called, and thereafter the virtual web page, i.e. the input screen or mask, opens and is the same for all product providers. After entry of the offer data in the input screen, the offer data assigned by the product provider by means of the password stored by the server and are not viewable for the next product provider who calls up the virtual web page. After expiry of the time limit, no offers at the assigned network address are accepted and the data from the web pages are compiled in the format required by the client and sent back to him by means of e-mail or fax.

In the case of fully automatic offer retrieval, a mail robot is used on pages of the product provider to automatically evaluate and answer the request. Unique item designations are transmitted in a predetermined format and the corresponding search process is carried out automatically in the database of the product provider. Additionally, the connection is established and the submission of the offer is achieved at the central server automatically by the mail robot.

CLAIMS

1. A system for data exchange in a network, in particular for automatic retrieval of offers, which comprises at least one central server (10) having a data storage unit, and is provided with an input connection unit and an output connection unit, and at least one client and a data provider (20, 30) for inputting and/or retrieval of data information into or from the data storage unit of the central server, which are connectable by an I/O connection unit via a network (40) to terminal equipment,

characterized in that,

the server comprises modules for the automatic selection of data providers depending on a client request and for the automatic forwarding of the request to the data provider.

2. The system as claimed in claim 1,

characterized in that

the data information requested by a client (30) are offers for specific products or services.

3. The system as claimed in claim 1,

characterized in that

the server comprises a module for anonymous or secure forwarding of data requests of a client (30) to a data provider, so that the selected data provider does not receive any information about the client.

4. The system as claimed in claim 1,

characterized in that

the server comprises a module for selecting data providers (20) by region.

5. The system as claimed in claim 1,

characterized in that

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the server (10) comprises a module for automatically notifying a data provider (20) when a request sent to said data provider remains unanswered after a predetermined period of time.

6. The system as claimed in claim 1,

characterized in that

the terminal equipment comprises PCs with modems (41), ISDN-connections (42), fax devices (44) or TV decoders (46) of interactive TVs.

7. The system as claimed in claim 1,

characterized in that

the server comprises a module for automatically converting and formatting data.

8. The system as claimed in claim 1,

characterized in that

the server is connected to external databases.

9. A method of exchanging data in a network, in particular for automatic offer retrieval, which network comprises at least a client, a central server and a data provider, the method comprises the steps of:

(1) Sending a data query or request of a client to the central server.

(2) Generating a list of possible providers from a provider pool by the server depending on the data in the query.

(3) Establishing a connection and transmission of the data query to possible data providers using simultaneous transmission of a network address for the reply.

(4) Receiving the desired data from at least a fraction of the possible data providers from the central server.

(5) Collecting the desired data information or data partial information by the central server and forwarding to the client.

10. The method of exchanging data according to claim 9,

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characterized in that,

the client sets a time limit for the preparation of the data information, and the server no longer accepts new data information after expiry of the time limit and forwards the data information already received to the client.

11. The method of exchanging data according to claim 9,

characterized in that,

the central server takes into consideration header data concerning the client when automatically generating the list of possible data providers.

12. The method of exchanging data according to claim 9,

characterized in that,

the central server converts and formats the data information.

13. The method of exchanging data according to claim 9,

characterized in that,

the central server processes several requests of various clients in parallel.

14. The method of exchanging data according to claim 9,

characterized in that,

the central server polls external databases when generating the list of potential data providers.

15. The method of exchanging data according to claim 9,

characterized in that,

the central server converts data requests of a client into audio, fax or e-mail requests to the possible data providers.

16. The method of exchanging data according to claim 9,

characterized in that,

the central server automatically distributes passwords to the data providers.

17. The method of exchanging data according to claim 9,

characterized in that,

the central server automatically generates a virtual web page for each data provider.

18. The method of exchanging data according to claim 17,

characterized in that,

following password entry by the data provider, the data information is recorded on the virtual web page generated by the server.

19. The method of exchanging data according to claim 18,

characterized in that,

receipt and processing of the data request, as well as data entry of the data information on the web page, is carried out using an automatic process by the data provider.

20. The method of exchanging data according to claim 9,

characterized in that,

the method steps are carried out by several central servers in the network.

21. The method of exchanging data according to claim 20,

characterized in that,

the central servers are synchronized.

22. Use of a user interface for a method according to one of claims 9 through 20 for the off-line generation of data requests for the central

server and for the automatic capture or reading in of the data information by the client.

23. Use of a method according to one of claims 9 through 20 for the automatic offer retrieval of goods, wherein the server generates product index numbers.

