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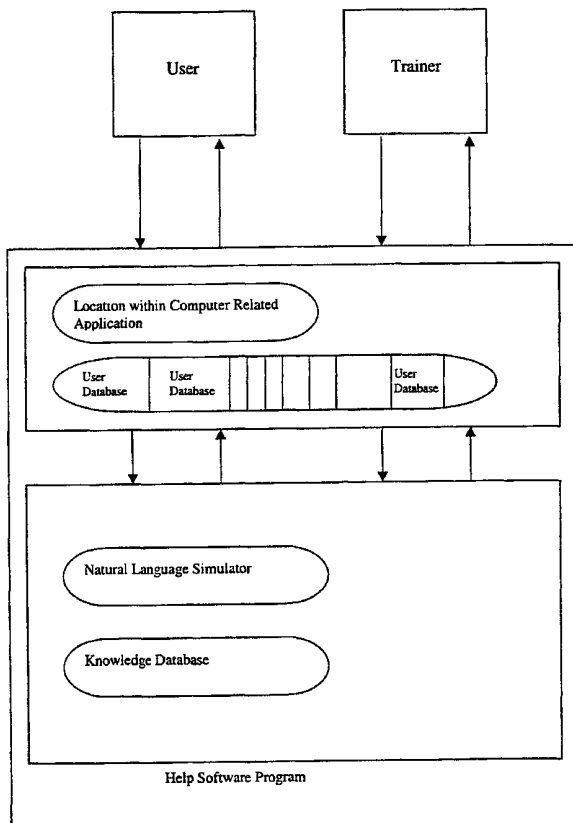
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(54) Title: HELP SYSTEM FOR A COMPUTER RELATED APPLICATION



(57) Abstract: The subject invention is a help program or system (Fig. 1) having a number of user databases (Fig. 1) and a knowledge database (Fig. 1). The help program may be used in computer related application (Fig. 2), such as a software program or an E-commerce web site. The help program includes a natural language simulator (Fig. 1) which parses sentences submitted by user or customer (Fig. 1). The natural language simulator also converts a formulated response into natural language, e.g. complete sentences. A trainer (Fig. 1) is provided to prepare, update, and maintain the knowledge database by interacting with the help software program or by otherwise editing the knowledge database. Input to the help program from the trainer takes the form of lessons that result in a change to the knowledge database and queries that test the knowledge database.



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HELP SYSTEM FOR A COMPUTER RELATED APPLICATION

BACKGROUND OF THE INVENTION

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1) TECHNICAL FIELD

The subject invention relates to a help program which may be initiated when a user is in a computer software program or on a web site.

10

2) DESCRIPTION OF THE PRIOR ART

Help systems are well known for use with computer software programs. The help systems can convey a response to a user by either written or oral communication. Many help systems are designed to simulate natural language conversations. In other words, the response is fashioned into complete sentences. One such example of a method for implementing a natural language interpreter is shown in
15 United States Patent No. 5,377,103. The current help systems simulate the natural language conversation by parsing and interpreting statements and queries from the user and then responding with sentences formulated from a predetermined knowledge database, typically by a browse function.

20

The prior art help systems are not capable of fashioning their responses to each individual user having a known history of queries and a particular need. Further, these help systems are not well suited for web site applications where the main goal is to direct the user or customer to a predetermined result, such as a sale.

25

SUMMARY OF THE INVENTION AND ADVANTAGES

The subject invention includes a method for utilizing a help software program or system having a plurality of user databases and a knowledge database. The
30 help program works in conjunction with a computer related application for interacting

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with a user in a natural language format when the user requires assistance in relation to the computer related application. The method comprising the steps of; identifying the user, obtaining an identification code of the identified user, searching the user databases to link the identification code with one of the user databases, accessing
5 specific user data related to the identified user from the linked user database, receiving a user's natural language input, interpreting the natural language input, formulating a response by integrating the natural language input from the user with specific user data from the linked user database and data from the knowledge database, submitting the response to the user, and updating the linked user database with the natural language
10 input and response whereby future responses may refer to the updated linked user database for the identified user.

Accordingly, the subject invention provides for a help software program or system which converses with a user in a natural language format and caters the responses to each individual user (the identified user). As will be discussed in
15 greater detail below, the subject method is also well suited for web site help systems in that the subject help system can assist in directing a user or customer toward a sale.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Figure 1 is a schematic diagram of a help software program in accordance with the subject invention;

25 Figure 2 is a flow chart illustrating the methodology for the help software program;

Figure 3 is a continuing flow chart further illustrating the methodology of the software program; and

Figure 4 is a flow chart completing the subject methodology.

30

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the Figures a schematic diagram of a help software program or system in accordance with the subject invention is generally shown in Figure 1. The help program may be used in computer software applications and for web sites, including e-commerce sites. The help program is also contemplated for use in other applications such as automotive products, appliances, homes and the like. As will be discussed in greater detail below, the help program operates to assist one or many users or customers with specific problems and can also guide the users to specific information such as related products and services. The number of users which the help program would support is only dependent upon the design requirements. For example, electronic commerce (E-commerce) applications will require simultaneous conversations with many users, while help systems in personal computer software will typically involve only one user conversation at a time.

The help program includes a natural language simulator which parses sentences submitted by the user or customer. The natural language simulator also converts a formulated response into natural language, e.g. complete sentences. Hence, the entire conversation between the help program and the user is in natural language. The help program also includes a knowledge database which houses a vast array of information relating to a number of applications, problems, suggestions, etc. The size and complexity of the knowledge database may vary depending upon the particular application and needs of the users. The formulated responses are based upon the help program's knowledge database. For example, the knowledge database can include specific information to provide the help program with information about a particular E-commerce site. Such information may include the sites products and services, how to use the site, and how to help the user in all aspects of an E-commerce transaction. The knowledge database for a software program will be information on the program's purpose, functions and features. Both the natural language simulator and knowledge database may employ neural networks, stochastic models, decision trees and/or other such techniques.

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A trainer is provided to continually prepare, update, and maintain the knowledge database by interacting with the help software program or by otherwise editing the knowledge database. Input to the help program from the trainer takes the form of lessons that result in a change to the knowledge database and queries that test the knowledge database. Queries and responses from the help program confirm updates to the knowledge database and reply to the trainer's queries. Responses also include reporting of conversations held between the help program and the user or users. The trainer is initiated or activated when it is necessary to establish the knowledge database and to initially populate the knowledge database with appropriate information. The trainer is also activated when it is necessary to update, edit or otherwise maintain the knowledge database. Further, the trainer is used for monitoring the help program by accessing records of past and/or ongoing conversations with the users.

The conversations between the help program and the user are mediated by a particular context. The contextual data are the fabric within which the conversations take place and include location and historical information.

The location is the 'place' in which the help program is invoked, i.e. that location in a particular computer software program's user interface, or the page on an E-commerce or other web site, etc. For example, the help program might be predisposed to provide an overview of products available at a web site once the site is opened. The help program can then discuss with the user his or her options and provide assistance. One feature of the subject help program is to increase sales at E-commerce sites by providing prospective customers with product and product related information in a natural language format. The help program will then navigate the user to appropriate locations in the web site to reveal product and product related content to the customer.

The historical information is included within a plurality of user databases and is the record of past interactions with a particular user. The databases are coded for each individual user such that when a user is identified, the user's personal database can be accessed. The identification code may be any suitable sign,

alpha/numeric code or the like so long as the user can be adequately categorized. The user databases are designed to store a myriad of information of a user such as specifics of previous conversations, the user's name, preferences, prior commercial transactions, user's buying habits, income level and any other relevant storable information.

5 Referring to Figures 2 through 4, the specific method of operation for the help software program is illustrated in greater detail. As discussed above, the help program works in conjunction with a computer related application for interacting with a user in a natural language format when the user requires assistance in relation to the computer related application. The computer related application may be either the
10 computer software program, a web site or any other application as outlined above. For illustrative purposes, the foregoing method will be described having the computer related application chosen by the identified user as being an E-commerce web site. It is appreciated that the subsequent discussion in no way limits the subject invention to E-commerce web sites.

15 Initially, the user or customer enters the E-commerce site. The help program is initiated by a request from the user for assistance or pro-actively by a software agent monitoring activity on the site. A graphical representation of the help program (not shown) is then displayed on the web page.

The type of computer related application is then determined. For this
20 example, the type of E-commerce site is determined and the specific location of the user within that site is determined. Specific information about the chosen computer related application, the E-commerce site, is incorporated into the response to the user. Under this example, the application is the web page being accessed by the user when the help program was invoked which defines the locational context for the help
25 program.

The user is then identified and classified as a past identified user or as a new user. If a past identified user, an identification code is obtained of the identified user. The user databases are then searched to link the identification code with one of the user databases. As discussed above, there is preferably only one user database for
30 each identified user. Specific user data related to the identified user is then accessed

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from the linked user database. The user data may include commercial transaction history, such as buying habits and past purchases, as well as personal and socioeconomic data as discussed above. If the user is a new user, a new user database is initiated and the new user is given an identification code for future reference.

5 A conversation between the help program and the user can now commence. First, a natural language input is received from the user. This natural language input may be an initiating question or a reply to a proposed question. In any event, the reply is expressed as a text string, either when it is retrieved from the keyboard or by interpretation by a spoken language processor (not shown) if the reply
10 is captured by voice. The text string (or natural language input) is then parsed and interpreted by the natural language simulator. The natural language conversation at this point is recorded and stored in the linked user database.

The specific user data for the identified user is then again accessed from the linked user database. The user data includes previous inputs and responses
15 for the identified user, e.g. past conversations. The past conversations assist in providing the context for formulating the response.

Progress toward attaining the help program's assigned goal is then assessed. As discussed above, the identified user is guided to a predetermined result based upon the particular computer application. In this example, the user will be
20 guided to a final sale within the E-commerce web site. The current input by the user is assessed against the predetermined result to mold future responses to the user in order to direct the user toward the desired result, i.e., the sale. The predetermined result or goal will vary from implementation to implementation.

The motivation for guiding a user to the desired result, sale, is to
25 maximize the total dollar amount of the help program enabled sales divided by the total time spent engaged with the help program. Activities associated with maximizing this value include the identification of products expected to be of interest to the user (customer), guiding the user to these appropriate products, obtaining information from the user and from other external databases, and assisting the user to complete the sales
30 transaction. The identification of the products expected to be of interest to the user is

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accomplished by accessing a product database, compiling information from the product database, and determining if any of the compiled information should be forwarded to the identified user with the response. If a product is expected to have high customer interest, the help program then determines the web page where the product's description is and then navigates the user to that web page.

In certain situations human intervention may be needed to provide additional information from either the knowledge database or the product database, or to achieve other objective specific to certain web site implementations. If needed, human intervention is accessed in a natural language format such that interaction with the help program and a human representative appears seamless to the user. In particular, the accessing of the human intervention includes the steps of; sending of the request for human intervention to an appropriate support person, summarizing the conversation and need for intervention, communicating this need to the support person, accepting input from the support person, and preparing this input for incorporation into the response.

A response is then formulated by integrating the natural language input from the user with specific user data from the linked user database and data from the knowledge database as well as information and data from other sources discussed above. The response is then submitted to the user. The submitting of the response is further defined as submitting a natural language response to interact with the user in a completely natural language conversation. In other words, the response is passed to the user as a natural language text string, when using a text base interface, or as an audible voice, when using synthetic voice recognition and processing.

As discussed above in detail, the formatting of the response is further defined as uniquely molding the response to the identified user based upon the specific user data from the linked user database. In other words, the response is tailored to direct the user to the predetermined result.

Completion of the conversation is then assessed. If the conversation is to continue, then the method returns to receiving another natural language input from the user. The above detailed steps are then repeated. If the conversation is completed,

then the linked user database is updated with the natural language input and response whereby future responses may refer to the updated linked user database for the identified user. The user database is also updated to include the products visited and purchased.

5 Pricing of the help program for a potential web site provider may be based upon the amount of time the user is in engaged in conversation with the help program. There may be a flat rate pricing plan that includes a flat rate per unit of conversation time. Alternatively, the pricing plan may be based on the value of the net sales divided by the use time. The rate would change as a function of this value. Of
10 course, each of these pricing plans would be negotiated with the web site provider.

 The invention has been described in an illustrative manner, and it is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation. Many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be
15 understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

CLAIMS**WHAT IS CLAIMED IS:**

1. A method utilizing a help software program having a plurality
5 of user databases and a knowledge database, the help program working in conjunction
with a computer related application for interacting with a user in a natural language
format when the user requires assistance in relation to the computer related application,
said method comprising the steps of;
- identifying the user,
10 obtaining an identification code of the identified user,
searching the user databases to link the identification code with one of
the user databases,
accessing specific user data related to the identified user from the
linked user database,
15 receiving a user's natural language input,
interpreting the natural language input,
formulating a response by integrating the natural language input from
the user with specific user data from the linked user database and data from the
knowledge database,
20 submitting the response to the user, and
updating the linked user database with the natural language input and
response whereby future responses may refer to the updated linked user database for
the identified user.
2. A method as set forth in claim 1 wherein the submitting of the
25 response is further defined as submitting a natural language response to interact with
the user in a completely natural language conversation.

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3. A method as set forth in claim 2 further including the step of utilizing a natural language simulator to parse the natural language input before the step of interpreting the natural language input.

5 4. A method as set forth in claim 3 further including the step of recording and storing the natural language conversation between the user and the help program in the linked user database.

10 5. A method as set forth in claim 1 wherein the formatting of the response is further defined as uniquely molding the response to the identified user based upon the specific user data from the linked user database.

15 6. A method as set forth in claim 5 wherein the uniquely molded response is further defined as guiding the identified user to a predetermined result based upon the particular computer application.

20 7. A method as set forth in claim 6 wherein the guiding of the identified user is further defined as assessing the current input by the user against the predetermined result to further mold future responses to the user in order to direct the user toward the desired result.

25 8. A method as set forth in claim 7 further including the step of determining the type of computer related application chosen by the identified user in order to further mold the responses to the user.

9. A method as set forth in claim 8 further including the step of accessing specific information about the chosen computer related application and incorporating this information into the response to the user.

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10. A method as set forth in claim 9 wherein the accessing of the specific user data for the identified user is further defined as accessing previous inputs and responses for the identified user.

5 11. A method as set forth in claim 9 wherein the accessing of the specific user data for the identified user is further defined as accessing commercial transaction history for the identified user.

10 12. A method as set forth in claim 9 further including the step of accessing a product database, compiling information from the product database, and determining if any of the compiled information should be forwarded to the identified user with the response.

15 13. A method as set forth in claim 1 wherein the help program further includes a trainer and the method further comprises the step of interacting the trainer with the help program to continually update and maintain the knowledge database.

20 14. A method as set forth in claim 13 wherein the step of interacting the trainer with the help program is further defined as initiating the trainer to populate, update and monitor the knowledge database.

25 15. A method as set forth in claim 1 further including the step of determining the need for human intervention and accessing human intervention in a natural language format such that interaction with the help program and a human representative appears seamless to the user.

30 16. A method as set forth in claim 1 further including the step of formulating a pricing plan for the help program based upon the amount of time the user is engaged in conversation with the help program.

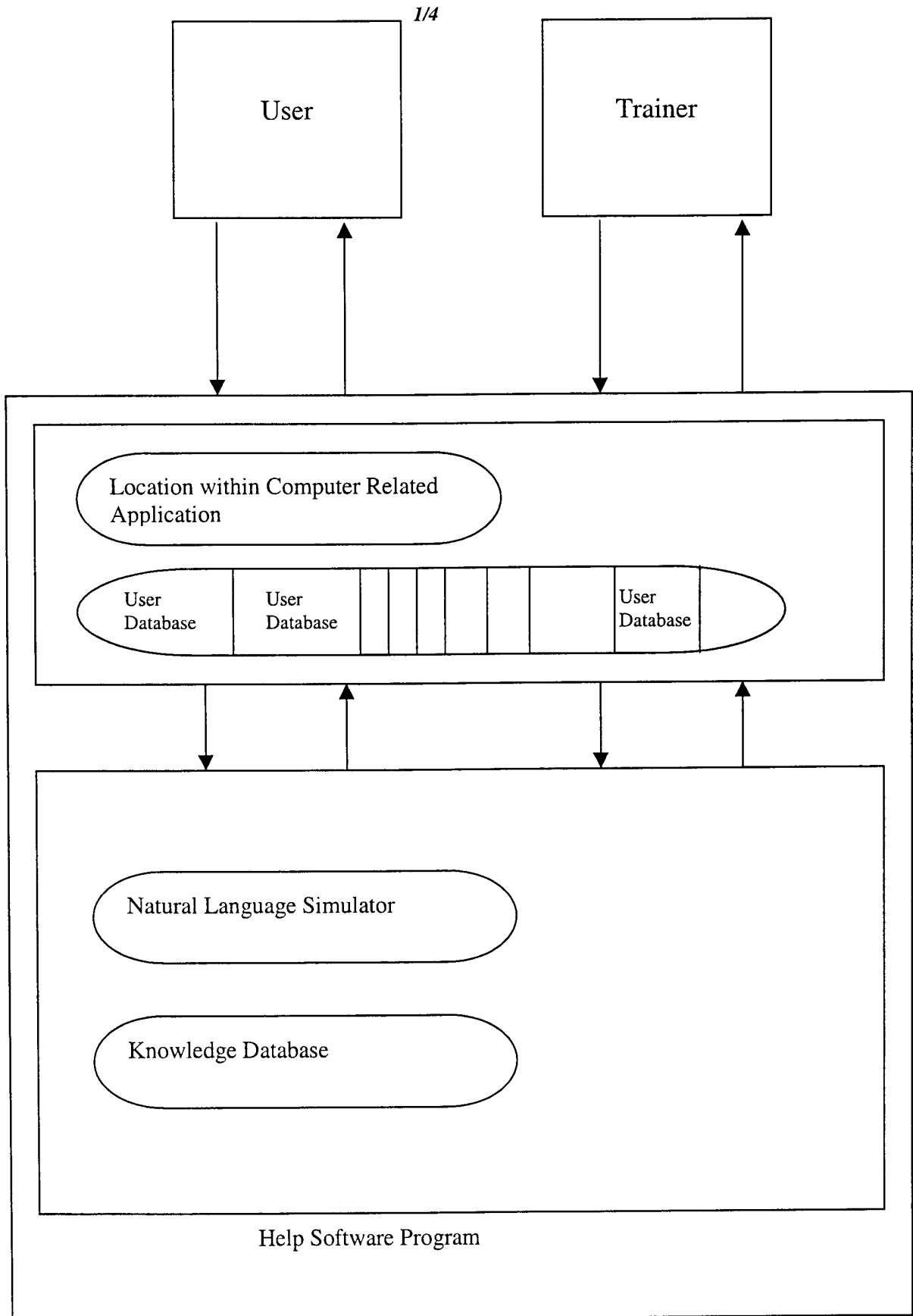


FIG. 1

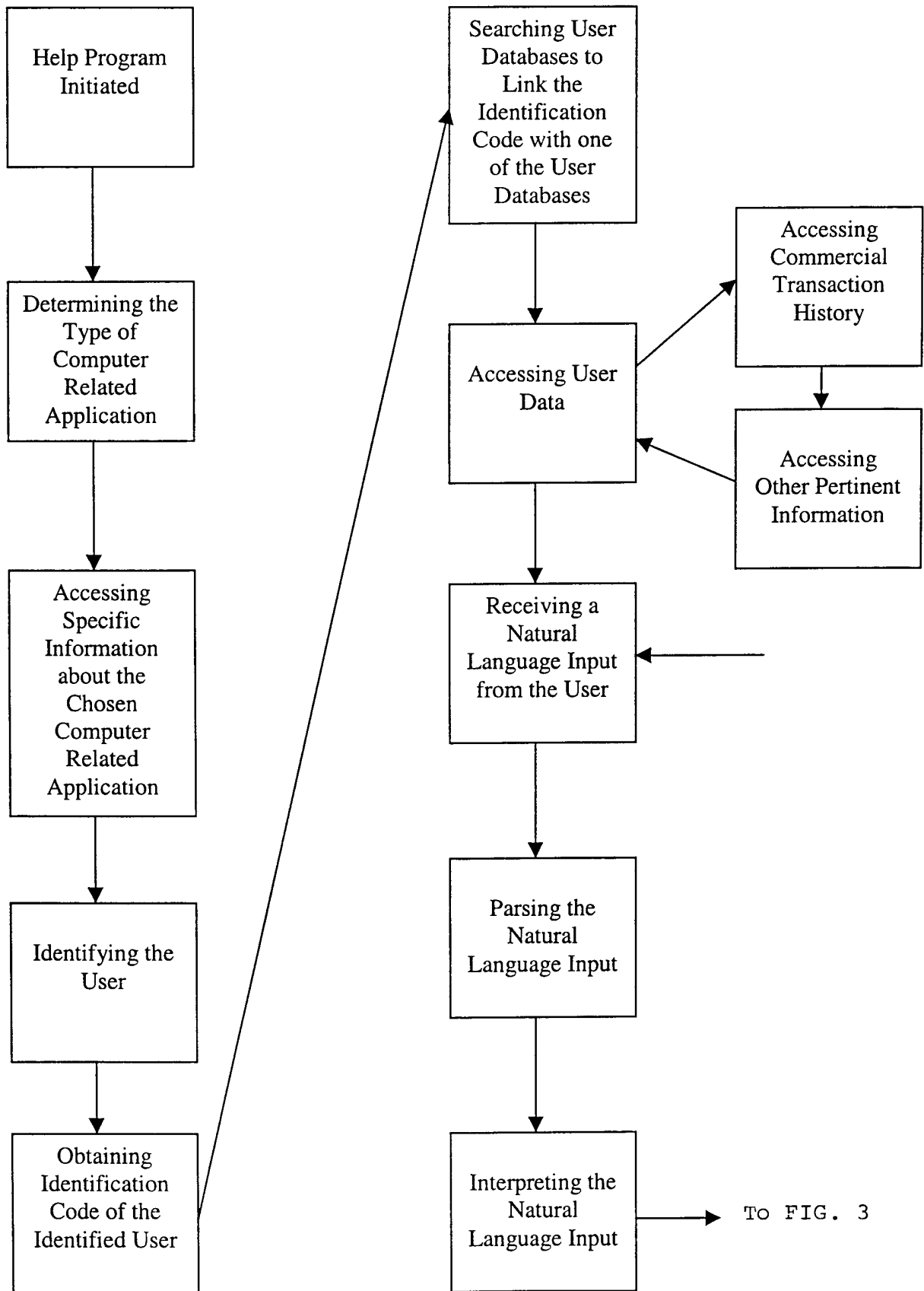


FIG. 2

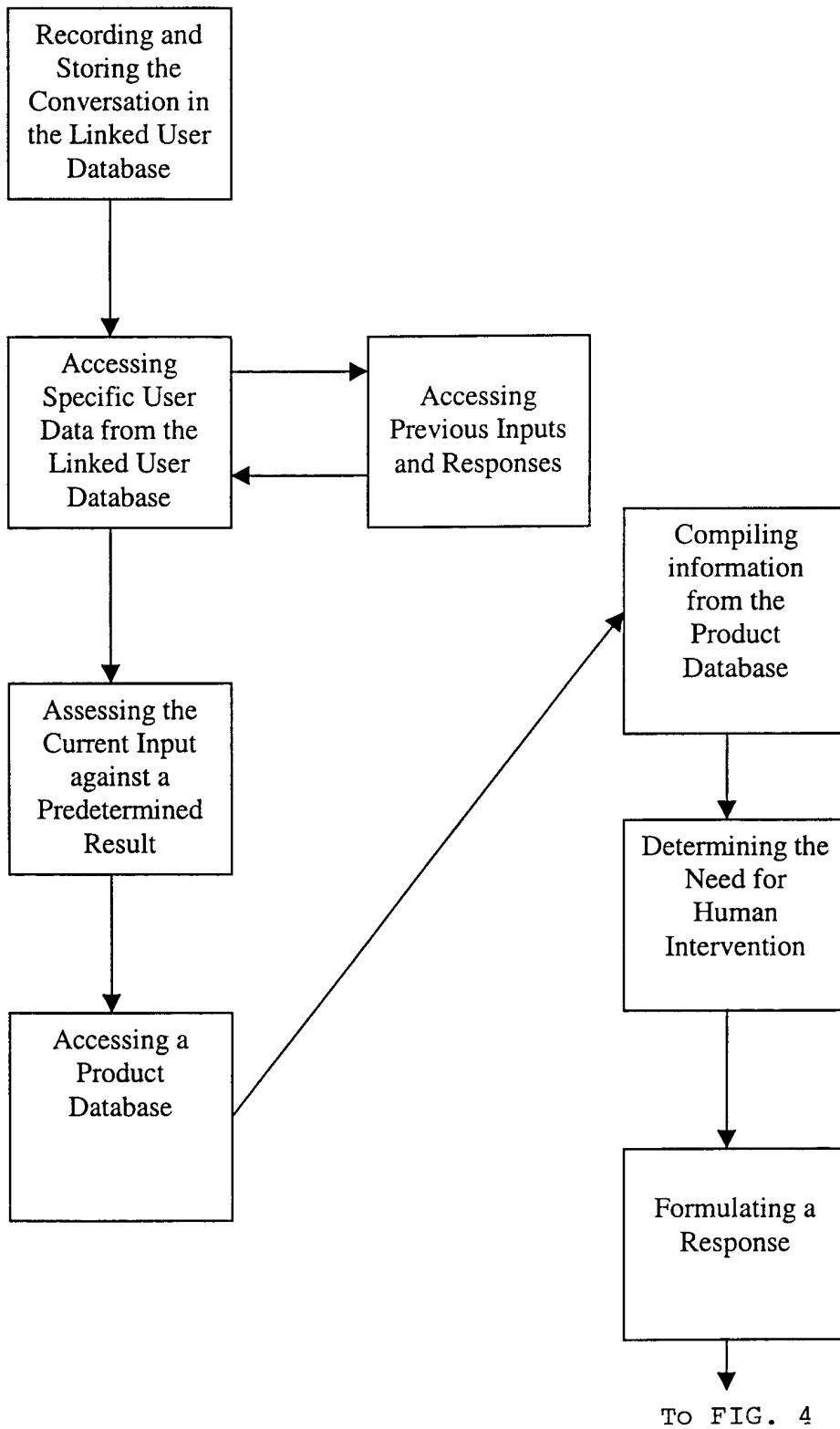


FIG. 3

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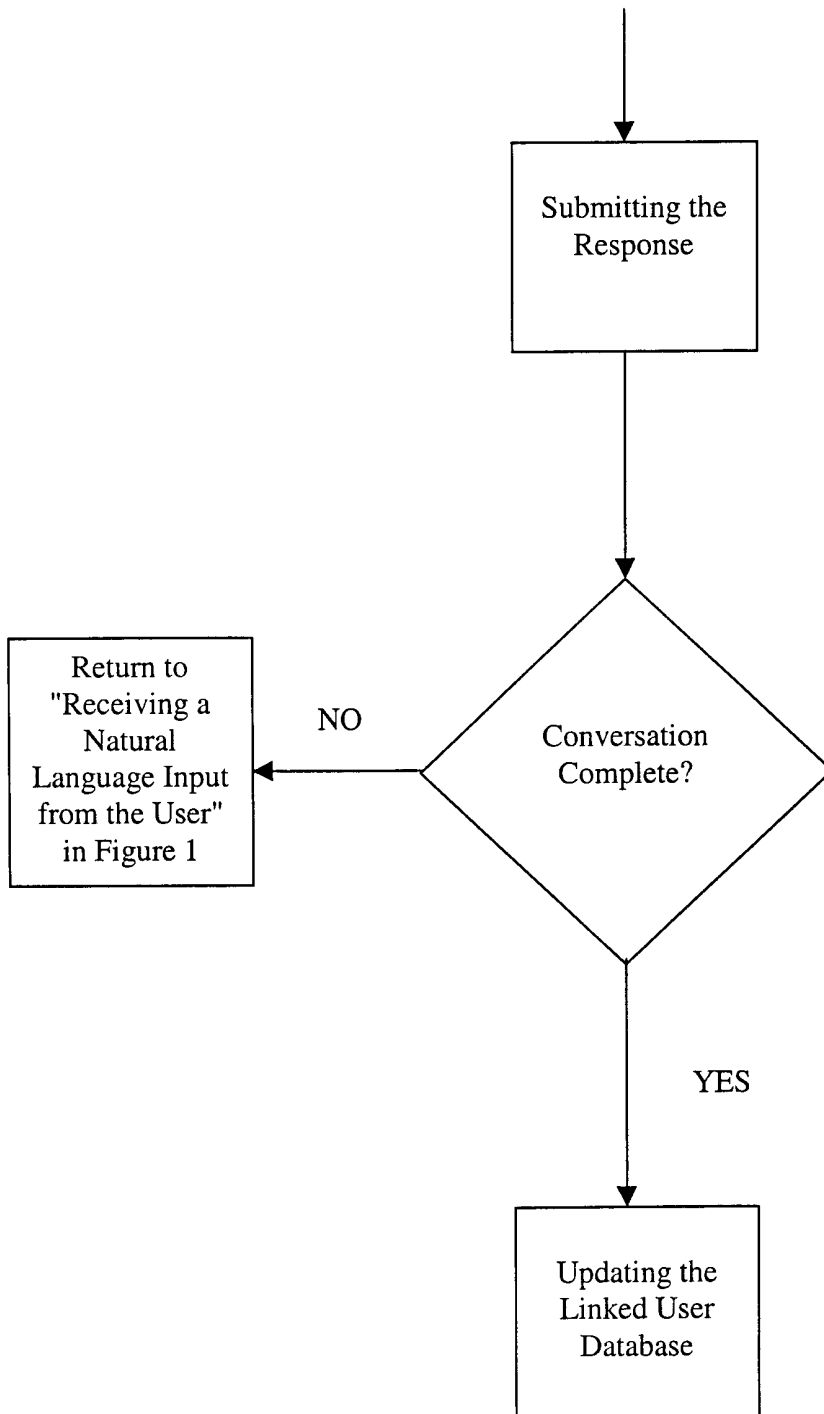


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/14997

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : G06F 9/44, 13/00, 17/30; H04L 12/66; H04M 15/00; US CL : 395/54, 379/111, 370/401, 395/605, 707/501 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 395/54, 379/111, 370/401, 395/605, 707/501 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	U.S. 5,634,051 A (THOMSON) 27 MAY 1997, column 3, lines 51-54, 66-67, column 8, lines 18-21, column 10, lines 3-4, 50-53 and column 11, lines 1-5.	1 ----- 2-16
Y	U.S. 5,379,366 A (NOYES) 03 January 1995, column 2, lines 46-58, col5 lines 23-26, 61-62 column 7, lines 53-55, column 9, lines 43-45, column 43, lines 34-46.	2-5, 10, 15
Y,P	U.S. 6,032,162 A (BURK) 29 February 2000, column 1, lines 51-54, column 3, lines 8-15, 36-40, column 4, lines 40-54.	6-9
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 11 JULY 2000	Date of mailing of the international search report 02 AUG 2000	
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/14997

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	U.S. 5,838,682 A (DEKELMAUM et al.) 17 November 1998, column 1, lines 50-59, column 6, lines 9-14, column 11, lines 56-67, column 14, lines 22-25, column 15, lines 45-50, column 16, lines 8-10.	11-14
Y,P	U.S. 5,978,455 A (JOHNSON et al.) 02 November 1999, Column 1, lines 29-38, Column 3, Lines 39-57.	16
A	U.S. 5,377,103 A (LAMBETTI et al.) 27 December 1994, ALL	1-16