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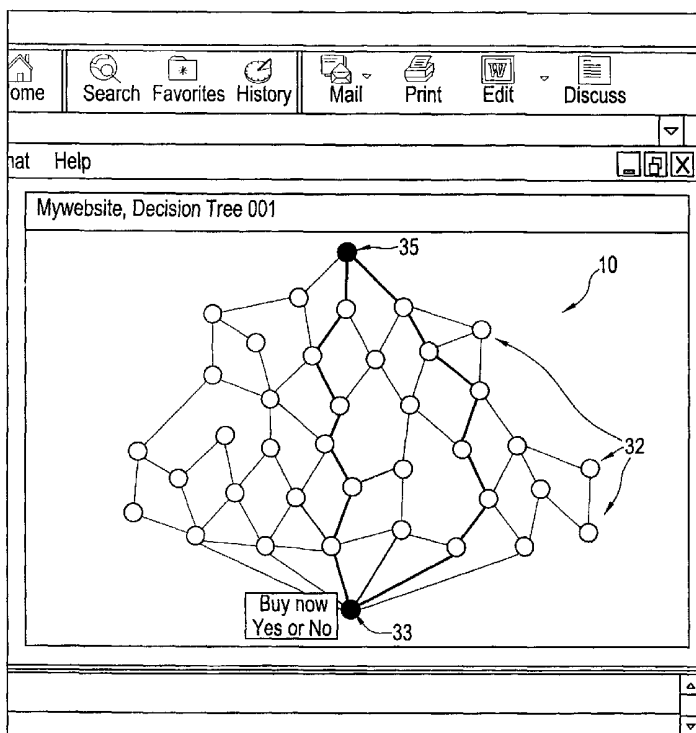
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(54) Title: METHOD AND USER INTERFACE FOR RETRIEVING CONTENT



(57) **Abstract:** Software tools that assist web developers and companies operating web sites to develop and maintain an E-assistant. The E-assistant is powered by a finite state machine and is able to guide a web site buyer through web site content in an interactive manner. The finite state machine is graphically represented on a display device as a dialog decision tree (10). Each state of the finite state machine is graphically represented by a node (32) on the dialog decision tree (10). At each node (33,32,35), the E-assistant conducts a personalized conversation with the web site buyer in a manner that leads the buyer towards one or more predetermined outcomes. The software tools that provide for creating these interactive dialog decision trees (10) include an interactive utility to assist a web site developer in structuring each node on the dialog decision tree (10). The nodes of the interactive dialog decision tree may be populated with links to databases for providing the level of detail necessary to interact with the web site buyer. These software tools provide companies with the capability of developing and marketing an interactive E-assistant that can offer for sale a multitude of goods and services to a multitude of customers without the additional cost of

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additional manpower.

METHOD AND USER INTERFACE FOR RETRIEVING CONTENT

Technical Field

The present invention relates generally to user interfaces, and, more particularly, to a dialog decision tree to interactively guide a user to desired content.

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Background of the Invention

The Internet affords a buyer an abundance of opportunities to purchase goods or services. Because of the Internet's ease of use, the need for skilled salespeople to guide a buyer through an on-line purchasing process is often overlooked. As a result, both individual consumers and professional buyers are often overwhelmed by the amount of data available on the Internet concerning a particular good or service. The inability of an Internet web site to deliver information in a manner that imitates the touch and feel of a live salesperson may result in lost sales.

Several efforts have been made to emulate a live salesperson when shopping on-line. In one case, various web sites have implemented knowledge-based databases for organizing a collection of answers to frequently asked on-line questions. The use of such knowledge-based database systems work well to answer a buyer's one-time on-line question, and are thus well suited for customer service functions but not sales functions. A knowledge-based database system is well adapted for answering a question such as, "What is the telephone number of your store in Boston, Massachusetts?" Although these systems work well to answer direct questions, they fail to create a seamless ongoing interaction with a buyer that emulates interacting with a live salesperson.

Because of the difficulty in emulating a live salesperson on-line, many conventional web sites have attempted to employ alternative measures. One such measure is to incorporate text-messaging systems for web sites. Such systems enable a trained customer representative and a buyer to interact through the exchange of text messages in a process similar to e-mail. Although the use of a text-messaging system provides interaction with a live customer service representative or salesperson, the cost associated with staffing a cadre of customer service personnel can make implementation prohibitive. Because the cost of recruiting, training, and compensating qualified personnel can be

high, such labor-intensive systems can be costly. In addition, the inability to attract qualified personnel can severely limit scalability of these systems. As a result, a web site relying on a text-messaging system may be unable to provide coverage 24 hours a day, 7 days a week, and/or may require an unacceptably-long queue time during certain time periods. These limitations may make it difficult for buyers to feel as if they are interacting with a live salesperson while shopping on-line.

Summary of the Invention

The present invention addresses the above-described limitations of conventional web tools by providing a web site dialog decision tree or "E-assistant" that converses with buyers via text, audio and/or video to emulate interacting with a live salesperson. The present invention is especially well adapted for web sites that are currently operational and that sell goods or services on-line.

In a preferred embodiment of the invention, a business enterprise with a web site agrees to purchase, lease, or license the tools necessary to create and implement a dialog decision tree, or "E-assistant". A dialog decision tree, as displayed by a display device, is a graphical representation a finite state machine (FSM). The tools to develop the E-assistant provide the business enterprise with a graphical user interface for developing and maintaining multiple dialog decision trees. The business enterprise has the option of using pre-constructed dialog decision trees, or may choose to build one or more dialog decision trees from scratch. Each node on a graphical dialog decision tree corresponds to a state in the FSM. The business enterprise has the ability to populate each node on the dialog decision tree with standardized text, audio and/or video. The standardized text, audio and/or video prompts a response from a web site buyer, or responds to a buyer's inquiry. For example, the first node on a dialog decision tree used for selecting a Mother's Day gift may include the following text statement: "Great Idea! My records show that last year you bought your mother a necklace. What do you think of flowers for this year?" The text dialog in the above illustration is an intermingling of text from a text dialog template and imported text from one or more databases or web sites providing historical user data and current product data. Additionally, the above-described text dialog may be replaced or supplemented by an audio or video dialog.

The above-described approach emulates interacting with a live salesperson. As

a result, there is no need for a business enterprise to add additional customer service representatives or sales representatives; rather the web site suffices to serve customer service needs. Moreover, the business enterprise is able to provide interactive sales and customer service support 24 hours a day, 7 days a week. A further advantage to the business enterprises is that the implementation of an E-assistant requires minimal changes to legacy databases, and is scalable to meet the requirements of any size business enterprise.

The above-described approach also provides the business enterprise with the benefit of being able to analyze product sales, product cross-sales, product up-sales or the like, in real-time fashion. A fully-implemented dialog decision tree may also take advantage of sales data to automatically alter dialog decision tree paths and product recommendations based on an analysis of select user data.

In accordance with one aspect of the present invention, a method is performed by a web server for providing an interactive dialog decision tree for web site navigation. Using a graphical user interface, the web server prompts a buyer with predetermined text, audio, video, or a combination of two or more of the formats, to carry on a conversation with a buyer. The focus of the conversation is to lead the buyer to one or more predetermined outcomes, including but not limited to the purchase of goods or services. The text, audio, video and/or graphics displayed by the graphical user interface may come from one or more databases owned, licensed, or leased by the web site's owner, or, alternatively, the graphical user interface may display content from multiple databases from multiple business enterprises.

The dialog decision tree interacts with the on-line buyer via a text dialog box. The text dialog box prompts a response from the buyer using text from a predetermined dialog text template that is associated with the active node on the dialog decision tree. Further, the dialog decision tree is able to recognize or decipher a buyer's natural language inquiry, including slang and semantic word variations, for determining the necessary data category, data sub-category, product information, transition trigger, and the like. Moreover, the dialog decision tree is able to record and recall buyer preferences for use in greeting a return buyer, predicting the appropriate starting point on the dialog decision tree of a return buyer, predicting the appropriate goods or services for an occasional buyer, suggesting alternative goods or services, or the like.

In accordance with another embodiment of the present invention, a method is practiced on a computer system such that a dialog decision tree is an integral component of a business enterprise web site. The computer system has an event calendar for offering products or services corresponding to a holiday, a birthday, an anniversary, Mother's Day
5 or the like. Further, the computer system provides a method of scheduling e-mail to select customers in order to advertise current specials, customer discounts, combination discounts, provide reminders, or the like.

In accordance with an additional aspect of the present invention, a method is performed for analyzing how buyers navigate the various dialog decision trees. Based
10 on this analysis, which includes probabilistic reasoning, dialog decision trees may be modified to restrict use of a certain path along the dialog decision tree, or, alternatively, the dialog decision tree may promote the path that generates the greatest revenue.

In accordance with another aspect of the present invention, a computer-readable medium is provided for programming an electronic device for performing the method of
15 creating an interactive dialog decision tree. The computer-readable medium allows a developer of a dialog decision tree to interact with the electronic device through a graphical user interface in order to develop and maintain a dialog decision tree. The programmed device also allows a buyer to interact with an operational dialog decision tree until a termination point, such as the purchase of goods or services, is reached.

20 Brief Description of the Drawings

An illustrative embodiment of the present invention will be described below relative to the following drawings.

Fig. 1 illustrates an example of how a dialog decision tree may be graphically displayed in the illustrated embodiment of the present invention.

25 Fig. 2 illustrates an overview of an electronic system suitable for practicing an embodiment of the present invention.

Fig. 3 depicts an example of the user interface provided by the illustrated embodiment for defining dialog decision tree nodes.

Fig. 4 is a flow chart illustrating steps that are performed in the development of
30 a dialog decision tree in the illustrated embodiment.

Fig. 5 illustrates an example of how the dialog tree wizard provides point-and-

click editing of a selected node on a dialog decision tree.

Fig. 6 depicts a set-up dialog box for selecting data categories and associated sub-categories.

5 Fig. 7 is a set-up status box illustrating a selected data category and a data sub-category for a selected node.

Fig. 8 illustrates a wizard set-up dialog box for selecting a field in a database.

Fig. 9 illustrates a set-up dialog box for defining database field limits.

Fig. 10 illustrates an example of a set-up dialog box for searching for a database field.

10 Fig. 11 illustrates an example of a set-up dialog box for mapping key words to database fields.

Fig. 12 depicts an example of a tracking report produced in accordance with the illustrated embodiment for analyzing navigation habits on a selected dialog decision tree.

Fig. 13 depicts data flow for an example dialog decision tree.

15 Fig. 14 is a flow chart illustrating the steps that are performed in selecting server content using an illustrated embodiment of the present invention.

Fig. 15 is a continuation of a flow chart from Fig. 14 illustrating the steps that are performed in selecting web server content using an illustrated embodiment of the present invention.

20 Detailed Description of the Invention

At the outset, it should be clearly understood that like reference numerals are intended to identify the same structural elements, portions or surfaces consistently throughout the several drawing figures, as such elements, portions or surfaces may be further described or explained by the entire written specification, of which this detailed description is an integral part. Unless otherwise indicated, the drawings are intended to be read (*e.g.*, cross-hatching, arrangement of parts, proportion, degree, etc.) together with the specification, and are to be considered a portion of the entire written description of this invention. As used in the following description, the terms "horizontal", "vertical", "left", "right", "up" and "down", as well as adjectival and adverbial derivatives thereof (e.g., "horizontally", "rightwardly", "upwardly", etc.), simply refer to the orientation of 30 the illustrated structure as the particular drawing figure faces the reader. Similarly, the

terms "inwardly" and "outwardly" generally refer to the orientation of a surface relative to its axis of elongation, or axis of rotation, as appropriate.

The illustrated embodiment of the present invention provides web site operators or owners with the tools for organizing and presenting content to an on-line buyer in a manner that emulates interaction with a live salesperson. In the illustrated embodiment, a finite state machine (FSM) is graphically represented as a dialog decision tree that can interactively prompt a buyer for a response. A FSM can be any electronic device that stores the status of something at a given time and can change the status and/or cause an action or output event to take place for any given change. In the illustrated embodiment, the FSM has an initial state or record of content stored someplace, a set of possible input events, a set of new states that may result from the input, and a set of possible actions or output events that result from a new state. The dialog decision tree is provided to a business enterprise to create an on-line E-assistant on the business enterprise's web site. The business enterprise may take advantage of pre-built dialog decision trees, or may choose to construct one or more dialog decision trees on its own. The business enterprise may integrate the dialog decision tree with one or more databases that contain product information or client information during development or maintenance of a dialog decision tree. The illustrated embodiment may be used to create a number of different interactive dialog decision trees, as will be described in more detail below. The illustrated embodiment provides the tools necessary to create an interactive natural language conversation between an electronic device, such as a computer that provides a web site, and a human.

The illustrated embodiment provides a graphical user interface partitioned into multiple windows for development and maintenance of a dialog decision tree. In one window, the dialog decision tree under development or maintenance is graphically represented, and in another window, the attributes of a selected dialog decision tree node are displayed. Attributes of the selected dialog decision tree may include a text template prompt, a node number, node transition criteria, HTML links and other attributes, which will be discussed in further detail below. The illustrated embodiment also provides each business enterprise with a database of anticipated user responses that may be used by the dialog decision tree to map a user's query to a particular data category, transition trigger or the like. For a minimal investment of time, money and manpower, the dialog decision

tree development tools of the illustrated embodiment provide business enterprises with a method for increasing web site revenue by providing tools to create a web site that emulates a conversation between two humans. This dialog decision tree is also advantageous to the web site buyer because the dialog decision tree has the ability to collect, record, and recall buyer information that may include last log-on, last item purchased, and upcoming occasions or events, such as a birthday or anniversary. As a result of having this type of data, the dialog decision tree may automatically start a dialog with the buyer at a particular node or dialog decision tree of particular interest to the buyer, present products of particular interest to the buyer, and may send reminders or notices of a coming event to a buyer via e-mail.

For purposes of the discussion below, it is helpful to clarify the meaning of a few terms.

A "text dialog template" refers to a text string that is used to communicate with an on-line buyer and may contain one or more links to one or more databases, web sites or the like. A text dialog template may be associated with one or more nodes on a dialog decision tree. The text dialog template can provide the user with a comprehensive text sentence of intermingled data from one or more databases. The links are used to import data in a text format to provide subject matter detail in the conversation between a buyer and the dialog decision tree. Each node on a dialog decision tree has an associated text dialog template for conversing with a buyer.

A "business enterprise" refers to an enterprise such as a commercial establishment. A business enterprise may include a corporation, a partnership, a sole proprietorship, a non-profit organization, a consortium or the like. The illustrated embodiment is especially well adapted for "for profit" businesses.

A "dialog decision tree" refers to a graphical representation of a possible set of user/agent interactions that are encoded as a combination of a finite state machine (FSM) and a probabilistic language model. The FSM describes the possible paths a conversation or interaction could take, in the form of nodes or states connected by different possible transactions. The probabilistic language model comprehends natural language, and is capable of learning a vocabulary from a set of training data that includes word variations such as "slang".

The term "data mining" refers to the analysis of data for determining data relation-

ships, associations, sequences, classification, clustering, forecasting, linking or the like to correlate data or an event to other data or events.

"Training data" is data regarding natural language phrases and terms that is used to map a buyer's natural language response/inquiry to the correct data category of interest. This data may be stored in a database, and may be used to statistically analyze the success rate of mapping a natural language phrase or term to a correct data category.

A "shopping dialog template" refers to a text dialog template that allows buyers to browse goods or services available for on-line sale or lease from a web site. This text dialog template is constructed to answer buyer questions and to provide product descriptions and personalized recommendations of the available goods or services.

A "reorder dialog template" refers to a text dialog template that allows a business enterprise to activate a text dialog template that reminds the buyer of a previous order and recommends a reorder of the same or revised goods or services.

A "quiz dialog template" refers to a text dialog template that provides a buyer with a series of multiple choice questions in order to gain insight into a buyer's preferences, or for training and education of employees, students or the like.

A "survey text dialog template" refers to a text dialog template that asks a buyer a series of questions and can collate the responses into a format that can be used to define buyer groups.

A "cross-sell dialog template" refers to a text dialog template that prompts a buyer to buy items related to a primary purchase. An example of a cross-sell may be batteries or a case for a camera.

An "up-sell template dialog" refers to a text dialog template that offers a buyer the opportunity to be shown the benefits of a product upgrade to a higher level model before placing a final order.

A "finder dialog template" refers to a text dialog template that helps a buyer decide the type and quantity of goods or services to purchase. This finder dialog template is useful when the buyer is not certain of the types of goods or services he wishes to purchase. The finder dialog template is able to ask the buyer a series of qualifying questions to help identify the types of goods or services the buyer may be interested in, and, based upon the buyer's answers and other available personal information, makes one or more personalized recommendations.

An "event dialog template" is a text dialog template that notifies the buyer of upcoming events and has the capability of offering the buyer personalized recommendations about goods or services related to the event.

An "event" is an occurrence of particular occasion that may be defined by the web site's owner or operator. An occasion may include an anniversary, a birthday, a wedding, Valentine's Day, Mother's Day, seasonal sales events, other sales events, or the like.

Fig. 1 is a graphical depiction of an example dialog decision tree 10 for use in the illustrated embodiment of the present invention. A dialog decision tree 10 is a mathematical construct consisting of a set of interconnected nodes 32 represented by the symbol S , a buyer's input 26 represented by the symbol (O) , and a transition function T that maps $SxO \rightarrow S$ for transitioning to the next logical node. One of the nodes must be labeled the start node 33 where all processing begins, and at least one node must be labeled an end node 35, which is a valid termination point in the dialog decision tree 10. Nodes are the graphical representation of corresponding states in the FSM. Each node contains a text string from the text dialog template for communicating with an on-line buyer. A node is able to process an input event, such as a natural language input from a buyer, and map the input event to training data using a statistical function to an event, in order to set an output event or transition to another node in the dialog decision tree. Those skilled in the art will appreciate that a dialog decision tree may be developed and maintained with more nodes than shown in Fig. 1. The present invention requires that there be at least one web site that is assisted by a dialog decision tree. As will be described in more detail below, the dialog decision tree 10 is presumed to be one of a plurality of dialog decision trees on a web site that are maintained in a hierarchal order and are all interconnected using various links. Those skilled in the art will appreciate that the depiction of the one dialog decision tree 10 in Fig. 1 is intended to be merely illustrative and not limiting of the present invention. The present invention may be practiced across a variety of computer platforms, such as UNIX, LINUX, WINDOWS, MACINTOSH and may also be practiced from electronic devices such as, a PC, a MAC, a personal digital assistant (PDA), an Internet appliance, an electronic device capable of communicating in wireless application protocol (WAP), an electronic device capable of communicating in voice over internet protocol (VOIP), or an electronic device capable of text-to-voice conversion. Moreover, the user interface of the present invention is not limited to a graphical user

interface and may include a command-line interface, a menu-driven interface, a voice recognition system or the like.

To provide a comprehensive interactive natural language communication with a buyer, each node on a dialog decision tree represents an intermingling of data from multiple sources. Product specific data, buyer specific data, event specific data, and the like, is stored outside of a dialog decision tree system on one or more databases associated the web site hosting a dialog decision tree. A node accesses data outside of the dialog decision tree using a linked list of records or database fields available to a particular node. The text dialog scripts used by each node for communicating with a buyer are contained within each node as an encapsulated object that has associated attributes and methods.

Fig. 2 is an overview of an electronic system suitable for practicing the present invention. One or more client devices 21 may access, via a network 23, the web server 12 hosting a dialog decision tree 10 in order to purchase goods or services contained in database 38. The interaction of one or more client devices 21 with web server 12 hosting a dialog decision tree 10 and database 38 will be discussed in further detail below. Client devices 21 may be any electronic device, such as a PC, workstation, MACINTOSH, Internet appliance, PDA, mobile phone or the like, that is capable of communicating with a second remote electronic device in a connectionless environment. Web server 12 and client devices 21 interface with network 23 via a communication link 5. Communication link 5 may be an Internet link, such as a wireless link, or a cable-style link such as fiber optic, co-axial, twisted-pair, or the like, or a hybrid link using both cable and wireless paths. Further, communication link 5 may be an Intranet link, Extranet link, Virtual Private Network (VPN) link, or the like. Moreover, network 23 may be an Intranet, the Internet, an Extranet, a VPN or the like. One skilled in the art will appreciate that the system depicted by Fig. 2 is merely illustrative and is not limiting of a system configuration suitable for practicing the present invention.

Fig. 3 illustrates a graphical user interface 54 that may be used by a webmaster, web developer, system administrator, or the like in developing or maintaining a dialog decision tree. Fig. 3 will be described in conjunction with the flow chart of Fig. 4. A web site owner or operator may purchase, license, or lease the tools necessary to create a dialog decision tree 10 as depicted by Fig. 1. These tools allow the web site owner or

operator to develop and maintain a dialog decision tree 10 through the web-based graphical user interface 54 depicted in Fig. 3. The graphical user interface 54 provides a menu bar 75 from which drop-down menus may be selected by the decision tree developer. The drop-down menus, as exemplified by Fig. 3, provide the dialog decision tree developer with options to perform desired actions or operations. The menus include File 76, Edit 78, View 80, Data 82, Reports 84, Format 86, and Help 88. The actions or operations available in each drop-down menu will be discussed in more detail below in Tables I-VII. To increase user friendliness and use of operation, graphical user interface 54 as displayed in Fig. 3 incorporates several Windows-like features and functions. The features and functions may include a comprehensive on-line help system, drag-and-drop facilities, resizing capabilities, and the ability to switch between applications on a host electronic apparatus 12, such as a web server. Additionally, the depiction of the Windows-based graphical user interface 54 in Fig. 3 is web-enabled to allow Internet access to reference documents, such as customer specific directions and recommendations, or to view another web site, or to obtain a software revision to upgrade a dialog decision tree. Those skilled in the art will appreciate that the depiction of the graphical user interface is intended to be merely illustrative and not limiting of the present invention and that other suitable user interfaces, such as a command-line interface, or a menu-driven interface may be used may be used in whole or in part to supplement or replace the graphical user interface of the present invention.

With reference to Fig. 3, the file menus listed on menu bar 75 are described in the below listed Tables I-VII. One skilled in the art will realize that the menu item components contained in Tables I-VII may be added or deleted from a file menu, or may be assigned to different menus with different names without departing from the scope of this invention. The description of the menu control elements illustrated by menu bar 75 is intended to merely illustrative and not limiting of the present invention.

Table I Menu Item: File	
Component	Description
New Tree	Allows a developer to create a new dialog decision tree.
Open Current Tree	Allows a developer to open a dialog decision tree that has already been created.

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Table I Menu Item: File	
Component	Description
Close	Allows a developer to close a dialog decision tree file in order to open another.
Save	Allows a developer to save changes made to a dialog decision tree.
Save as	Allows a developer to save changes made to a dialog decision tree as a different dialog decision tree.
Preview	Allows a developer to preview a current tree.
Submit	Links dialog decision tree to a web site. Sets options for how and where to launch the dialog decision tree within web site.
Print	Allows a developer to print a hard copy of the dialog decision tree they are working on.
View Dialog Templates	Allows a developer to preview pre-built dialog text templates.
Select Dialog Template	Allows a developer to select a pre-built text dialog template in order to expedite creation of a dialog decision tree.
Launch Dialog Wizard	Allows a developer to select from a pre-built list of text dialog templates and their related wizards, including up-sell, cross-sell, finder, shop, special offer and event.
Checker	Checks a text dialog template or a specific node for omissions and mistakes. Can be configured for a particular node, set of nodes or to check an entire dialog decision tree.
Map Dialog	Allows developers to map current chat dialog from internal sales and/or customer service personnel into a dialog decision tree template.

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Table II Menu Item: Edit	
Component	Description
Undo	Allows a developer to reverse the last action made to a dialog decision tree.
Repeat	Allows a developer to repeat the last action made to a dialog decision tree.

Table II Menu Item: Edit	
Component	Description
Cut Node	Allows a developer to cut a current node out of the dialog decision tree. The node is then available for pasting.
Paste Node	Allows a developer to paste a node into a different place on the dialog decision tree.
Clear Node	Allows a developer to erase a node.
Select All Nodes	Allows a developer to select an entire dialog decision tree.
5 Link Node	Allows a developer to link a node to an HTML page or web site index. For example, if the text dialog template was discussing a particular item, the web page for that item might appear.
Find Node	Using key words, the developer can find a specific node in the dialog decision tree. For example: a buyer could type in the words "golf clubs" to find all the nodes with those terms in them.
Merge DB Fields	Allows a developer to merge fields from the database into the dialog text being written. For example, the buyer could type: Hello [NAME] how are you today? The system prompts the developer with a list of fields that have been imported from a database.
Attach Audio/Video	Allows a developer to attach an audio or video file to a selected node.
Node Wizard	This menu item launches a wizard that walks a developer through the creation of a node. Automatically runs when editing the tree.
10 Create Section	Allows a developer to create mini-trees called sections that branch off from the main tree. For example, if the developer wants to insert a small section about the history of a particular item so that their customers can go off on this "mini-dialog decision tree" and then return to the main tree.
Select Transition	Allows a developer to select a node transition from a pre-built set of transitions, such as yes/no, true/false.
Edit Transition	Allows a developer to create new training data to refine a particular transition. For example, if you want to be sure that the latest slang for NO is in your transitional node, this allows a developer to edit the training data.

Table II Menu Item: Edit	
Component	Description
Custom Transition	Allows a developer to create their own transitions and training data for unusual situations.
Insert Comment	Allows a developer to attach a comment to a particular node.

Table III Menu Item: View	
Component	Description
View Tree	Allows a developer to view the entire dialog decision tree.
View Sections	Allows a developer to view the different sections of the dialog decision tree.
View Nodes	Allows a developer to view a node or group of nodes.
View Path	Displays all nodes directly connected to a particular highlighted node.
Zoom	Allows a developer to zoom in on different parts of the dialog decision tree. Particularly useful for larger dialog decision trees.

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Table IV Menu Item: Data	
Component	Description
Import/Export Wizard	Walks a developer through the import and export of customer or product data from the organization to the dialog decision tree system.
Import/Export Data	A console for doing the same thing without the Import/Export Wizard.
Refresh Data	Upload new data from a database automatically, or at the developer's discretion.
Link Fields	Allows developer to link data from a database to the dialog decision tree system.
Set Data Preferences	Allows developer to set preferences on how to connect to the dialog decision tree API and when/how/if to import, export, and update data.

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Table IV Menu Item: Data	
Component	Description
Set Data Smarts	Allows developer to group product data in a spreadsheet-like format so that the system can make smart recommendations such as cross-sells and up sells.
Set Smart Dialog	Allows developer to activate the "Smart Dialog" feature in the dialog decision tree system. This function auto edits text dialog templates by buyer or buyer group depending on historical use.
Set Campaigns	Allows developer to create proactive campaigns, such as auto e-mails once a quarter to customers.

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Table V Menu Item: Reports	
Component	Description
Set Alerts	Allows a developer to set alerts for a dialog decision tree. For example, if a certain dialog decision tree gets over or under a particular response rate, the system administrator can have an alert sent to marketing. Provides alerts by e-mail, pager, fax and palm.
Sales Reports	Built-in Reports that show amount of manpower saved with the dialog decision tree and amount of revenue earned.
Built-in Reports	Runs reports by text dialog template, section, time of day, traffic levels, specific buyer, groups of buyers and so on.
Custom Report Writer	Allows a developer to output a log file in Access or SQL.

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Table VI Menu Item: Format Chat	
Component	Description
Font	Allows developers to specify the font that appears in the chat box.
Alignment	Allows developers to specify the alignment of the text within the chat box.

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Table VI Menu Item: Format Chat	
Component	Description
Color	Allows developers to specify the colors that appear in the chat box.
Design Template	Can use several built-in design templates for how the chat is represented (different colors, styles, fonts and so on).
Preview Format	Allows developers to preview the format of a chat box before accepting or canceling changes.

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Table VII Menu Item: Help	
Component	Description
My E-Assistant	On-line help that allows developers to ask questions about creating, managing or editing their e-assistant dialogs
Help	Search-based help
About	Provides the developer with basic information concerning the operating dialog decision tree.

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With further reference to Fig. 4, the graphical user interface 54 is able to provide a developer (such as a webmaster, a web developer or a system administrator or the like) with a partitioned window for simultaneous viewing of a dialog decision tree 60 under development and provide a second window 61 for defining and reviewing a selected node's attributes. In the illustrated example, a selected node 56 is shown on the dialog decision tree 60. A developer selects one of the nodes 32 represented in a point-and-click fashion using a mouse or other similar pointing device. For each selected node 56, a node identifier is displayed on the dialog decision tree 60 of the graphical user interface 54, and the attributes of the selected node 56 are displayed in the window 61 of the graphical user interface 54. A third window 58 may be optionally employed to provide developer prompts during development or routine maintenance of dialog decision tree 60.

Window 61 provides a visual representation of the selected dialog decision tree

node 56 attributes. In order to segregate the attributes of the selected node 56, window 61 may also provide attribute labels for increasing user friendliness. As shown in the illustrated embodiment, typical attribute labels include node label 62 for identifying the node number assigned to the selected node 56, a text label 64 for identifying the text dialog template assigned to the selected node 56, a transition label 66 for determining when a buyer's response triggers a transition to the next appropriate node on the dialog decision tree 60, an HTML label 68 for identifying a web site index that the node 56 is linked to, an audio label 70 for identifying attached audio files, and video label 72 for identifying attached video files. As illustrated by Fig. 4, window 61 is able to provide a scrollable text box for listing multiple attributes, such as selection of node transition triggers.

With reference to Figs. 2, 3 and 4, a developer may implement a dialog decision tree 10 on a web site in the following manner. Once the developer has identified a server 12 to host the dialog decision tree 10, the developer may begin populating nodes 32 of a pre-constructed dialog decision tree 10 using the graphical user interface 54 (step 44). To increase user friendliness and to help expedite implementation of a dialog decision tree 10 on a web site, a dialog tree wizard 90 (Fig. 5) is provided. From the graphical user interface 54, a developer can select the dialog tree wizard 90 from Edit menu 78 (see Table II). Alternatively, the dialog tree wizard 90 may be automatically launched once a developer enters an edit or maintenance mode on a selected dialog decision tree 60. Dialog tree wizard 90 allows a developer to assign the appropriate text dialog template to the selected node 56 (step 46). The dialog tree wizard 90 also provides the developer with a node status 63, and the ability to define the node transition event that triggers a transition to another node upon occurrence of the event (step 48).

As exemplified in Fig. 5, dialog tree wizard 90 includes a number of list boxes for defining how and when to transition from the selected node 56 to another. As illustrated, the dialog tree wizard 90 provides a first list box 92 for dialog decision tree instructions in the event that a buyer responds with a "yes" at node 56. A second list box 94 defines the appropriate link to initiate when the buyer respond with a "yes". A third list box 96, provides direction for the dialog decision tree 10 on where to transition to should the buyer respond with a "no".. The fourth list box 98, provides the transition link for a buyer's "no" response. Those skilled in the art will appreciate that the depiction of

the dialog tree wizard 90 and content of the list boxes are intended to be merely illustrative and not limiting of the present invention. Other user interface elements may alternatively be provided in the wizard 90. For example, radio buttons may be used instead of list boxes. Moreover, the node parameters that are "settable" may vary from those shown in Fig. 5.

The dialog wizard 90 further provides a "Search Nodes" button 104 for searching attributes of other nodes in the associated dialog decision tree 60. The ability to search other nodes for the same attributes advantageously expedites dialog decision tree editing. For example, if a developer wishes to edit all nodes utilizing a "yes/no" node transition, the developer could use the "Search Nodes" button 104 to identify all nodes containing a "yes/no" transition. Additionally, the dialog tree wizard 90 provides an "OK" button 100 to accept attribute changes, and a "CANCEL" button 102 to reject attribute changes. When the dialog decision tree developer has completed defining the attributes of a selected node 56, the developer may use a mouse or similar pointing device to select the done button 74 in window 61 or may simply point-and-click on another node in the dialog decision tree.

To construct a finder dialog template, a developer may use the dialog template wizard 106, as depicted by Fig. 6. The dialog template wizard 106 may be launched by selecting the "Launch Dialog Wizard" menu item from the "File" menu (See Table I above). Dialog template wizard 106 is an interactive utility that allows a developer to identify database fields currently used by the legacy web site and allows the integration of selected fields into a dialog template. To expedite development of a dialog decision tree, a developer may advantageously use the predefined dialog templates provided with the dialog decision tree system. The dialog decision tree provides predefined dialog templates for a number of popular data categories, such as books, electronics, housewares or the like. The use of the predefined dialog templates helps to reduce the time needed for implementation of a dialog decision tree system into a legacy web site. A dialog template on a dialog decision tree, may be launched automatically when a buyer performs a certain action, such as clicking on an icon or a certain web page, or may automatically initiate in response to a buyer's inquiry such as, "I am interested in a digital camera." As illustrated, dialog template wizard 106 provides a developer with a first text scroll box 108 for selecting a database category of interest, and a second text scroll box 110 for

selecting data sub-categories. To link the displayed categories and sub-categories of the database to the dialog template, a developer highlights the desired data category and sub-category using a mouse, or other pointing device (step 50). When the developer is satisfied with the selected data category and data sub-category, the developer can click
5 on "OK" button 100 to integrate the category and sub-category selections into the dialog template (step 52). If the developer is not satisfied, the developer can reject the selected data categories and sub-categories by selecting the "CANCEL" button 102. The dialog template wizard 106 may be used to construct a variety of dialog templates for obtaining and providing buyer information. Other typical dialog template names may include,
10 shopping, reorder, quiz, survey, cross-sell, up-sell, finder, event, or the like.

The dialog template wizard 106 also provides the developer with text instructions 112 on how to proceed should no data appear in either text scroll box 108 or text scroll box 110. In such event, the developer may select the "Link Wizard" button 114 and have data categories imported from various databases associated with the web site
15 implementing the dialog decision tree 10.

As illustrated by Fig. 7, when the developer selects the "OK" button 100 on the dialog template wizard 106, a status window 116 is brought forward to confirm the developer's selections. The status window 116 may include a "Selected Field" status 118 for indicating the selected data category and sub-category, a "Completed Field" status
20 120 for indicating the number of finder features completed, a "To Set Finder Features" field 122 which provides instructions to the developer regarding finder features and the active dialog template, and a "To Finish Dialog" field 124 which provides instructions to the developer on how to complete the dialog template. As shown in Fig. 7, the dialog template wizard status window 116 provides a developer with a "Done" button 130 for
25 indicating when the developer has completed the template dialog, a "Use" button 128 to implement the selected data categories and sub-categories into the dialog template, and a "Mine" button 126 that allows the developer to search a data field on a database for additional data categories and data sub-categories.

Once the developer has chosen the appropriate data categories and data
30 subcategories for the dialog template by selecting the "OK" button 100, the dialog template wizard 106 provides the developer with a new template window 132 for selecting database fields. The new template window 132 allows the developer to define

the data fields in a selected database or databases to which selected data category/sub-category combination points to when selected by a buyer. Template window 132 (as shown in Fig. 8) provides an instruction header 112 to the developer containing a selected status 118 that identifies the selected data category and data sub-category. Database fields corresponding to the selected data category and data sub-category are listed in scrollable text box 134 and may be selected by the developer in a point-and-click operation using a mouse or other similar pointing device (step 52). Template window 132 allows a developer to define data field thresholds, ranges, or limitations 136 that correspond to the selected data field. The number of data field thresholds, ranges or limitations selected is used to control how selected product data is displayed to a buyer. Additionally, template window 132 provides a text field 140 so that the developer can insert a text statement in support of the number of data field discriminators chosen. At any time, the developer may select the "OK" button 100 to accept the selections or alternatively may select the "CANCEL" button 102 to reject the selections.

If the developer selects the "OK" button 100 depicted by Fig. 8, the dialog template wizard 106 closes window template 132 and brings forward a new window template 142. Window template 142, as illustrated in Fig. 9, may include a "Finder Feature" status field 144 to indicate the selected data field and another "Option" status field 146 to indicate the number of field differentiators. A scrollable text box for displaying and selecting data field range 148 is provided to the developer for identifying the data range of the selected data field. The developer may select a data field range using a point-and-click mouse operation (step 50). In addition, window template 142 provides the box 150 for entering the text string that is used by the dialog template in assisting a buyer to narrow product categories. At any time, the developer may select the "OK" button 100 to accept the selections or alternatively may select the "CANCEL" button 102 to reject the selections.

Fig. 10 illustrates window template 152, for use by the developer to search for a desired database field in one or more databases. Window template 152 provides the dialog decision tree developer with instructions 112 on searching a database for additional fields. A data category status 118 and a scrollable text box 134 list the currently-linked data fields in the selected database. If the dialog decision tree developer cannot find a desired data field in scrollable text box 134, the developer searches the

selected database by entering a desired term in text box 154 to mine for that desired data field. The developer may limit the database field search by entering the appropriate information in text box 156, text box 158 and by selecting whether to remove duplicate field names 160 (step 50). If the dialog developer wants to accept the database field search criteria, the developer can select the "OK" button 100. On the other hand, if the developer no longer desires to perform the database field search, he or she may select the "CANCEL" button 102 to cancel the entered search.

As illustrated in Fig. 11, the results of the database field search are reported to the developer in window template 162. Window template 162 provides the developer with a header 163 to indicate the mined data field term and further provides the search results in scrollable text box 164. At text field 166, the developer enters the keyword that the dialog template recognizes as the trigger for searching the selected data field 163. The developer is given the opportunity to select at text box 136 the number of ways to break-down the data content of the selected data field when an on-line buyer requests information pertaining to the selected data field (step 50). Window template 162 also provides a text box 140 so that the developer may enter a text description or reminder as to why this data field and the data limit were chosen. Upon completing window template 162, the developer may choose the "OK" button 100 to accept the matter displayed in window template 162, or alternatively may select the "Change Specs" button 168 to return to window template 152 and mine the database using another term. Those skilled in the art will appreciate that the dialog template wizard described above is intended to be merely illustrative and not limiting of the present invention.

Fig. 12 depicts an exemplary graphical user interface 54 for displaying the results of the built-in report generator component. The built-in report generator provides a developer with a graphical image representing the effectiveness of a selected dialog decision tree 11 over a period of time. This allows a developer to refine and edit a dialog decision tree 10 based on data from a group of buyers, a particular buyer, historical use of the dialog decision tree, or the like. The selected dialog decision tree 11 depicts an exemplary graphical representation of the report results on graphical user interface 54. The partitioned window provides a data window 59 to assist the developer in interpreting the data concerning the selected dialog decision tree 11. Some of the dialog decision tree attributes that may be displayed in window 59 include the name of the selected dialog

decision tree 208, the name of the report that generated the results 210, the results 212, and further operator instructions 112. As depicted in this exemplary illustration, the report chosen for analyzing the selected dialog decision tree 11 is named "Path Popularity" 210, and is capable of highlighting the most popular path 214 in a color such as red. "Path Popularity" report 210 can also indicate the "Best Revenue Generation" path 216 and highlight that path with a different color, such as blue, and the "Path Popularity" report 210 may also indicate the "Least Popular Path" 218 as highlighted by another color, such as yellow. Those skilled in the art will appreciate that the depiction of the report generator results is intended to be merely illustrative and that other reports and colors may be used to analyze one or more dialog decision trees from a business perspective.

Fig. 13 provides a system overview 20, of an exemplary dialog decision tree 10 depicted by Fig. 1, indicating a remote buyer 24 communicating via the Internet 22 to a second electronic device 12, such as a web server, that is hosting the dialog decision device 14 capable of remotely communicating with a second electronic device 12 initiates a communication with the second electronic device 12 through the use of a cookie, a session ID assigned when buyer 24 arrives at the web site, an attached registration ID or the like (step 170). Once buyer 24 has forwarded the appropriate buyer ID, the second electronic device 12 retrieves any available buyer information associated with the identified buyer (step 172). Buyer information may include last purchase, last log-in, average dollar value of goods purchased, number of purchases per month, or the like. If information is available concerning a buyer's historical buying practice, or if there is an upcoming event, such as a birthday or holiday, the system 20 may suggest to the buyer 24, based on the available buyer data and event data, a product or products for purchase (step 174). If the buyer 24 accepts the suggestion to purchase (step 176), the system 20 automatically jumps to the appropriate node on the dialog decision tree 10 so that the buyer 24 may purchase the suggested product or products (step 178). If the buyer 24 does not desire to purchase the suggested product or products (step 176) the buyer 24 can enter information concerning a desired product or event of interest 26 (step 180). Once buyer 24 has entered a request 26, the request 26 is transmitted via the Internet 22 to the second electronic device 12 where the dialog decision tree 10 maps the buyer's entry 26 to a data category 30 (step 182). One skilled in the art will appreciate that other

communication links between a first electronic device and a second electronic device hosting a dialog decision tree may be utilized, such as a wireless link, a dedicated link, a hybrid of wire and wireless, or the like.

The dialog decision tree 10 maps the buyer's request 26 to a data category on database 30 by first using a normalization technique, as will be discussed below, to change valid alternative forms of a word into a canonical form, and then using probabilistic reasoning to compute the most-likely data category for the request. An example of the normalization technique includes the conversion of the term "Xmas" or "X-mas" into the canonical form of "Christmas." Database 30 contains multiple data categories as depicted by data category 28, data category 29, and data category 31. If the dialog decision tree 10 is able to map the buyer's request 26 to a data category on database 30 using a probabilistic technique that involves a statistical analysis and statistical weighting of historical buyer requests from other buyers (step 184), the dialog decision tree 10 selects the appropriate data category database 30 that represents the best match to the buyer's request 26 (step 188). As exemplified by Fig. 13, data categories on database 30 include data categories that match to events or special occasions, such as a Father's Day data category 29, a christening data category 31, a Mother's Day category 28, or any other data category that may be defined by the developer. If the dialog decision tree 10 is unable to map the buyer's request 26 (step 194), the dialog decision tree 10 requests the buyer 24 to clarify request 26 so that the dialog decision tree 10 can attempt another data category mapping (step 186). Once the dialog decision tree 10 has mapped a buyer's inquiry 26 to a best match category found in database of data categories 30, the dialog decision tree 10 requests additional buyer input (step 190) by using the dialog text template 34 associated with the active node. As illustrated by Fig. 13, a dialog text template 34 is a compilation of predetermined text and database links associated with the selected node 56, such as the illustrated dialog text template corresponding to the initial node in a Mother's Day dialog decision tree 27. Dialog text template 34 is supplemented by text data from a buyer database 36 containing historical buyer data and a product database 38 containing product data to assist the buyer 24 in identifying desired goods or services available for purchase. Moreover, the dialog text template 34 may be further supplemented with an audio or video file from database 40 or may use existing HTML pages 42 from one or more available databases.

Given a buyer's response or inquiry 26 is in natural language, there are an infinite number of ways for the buyer 24 to convey that he or she wants to buy. For example, a buyer 24 that wishes to purchase a gift for his or her mother may enter "I want a gift for my mother", "I'm looking for something for Mother's Day", "gift for mother", "My
5 mother's birthday is coming up and I want to buy her something", etc. Rather than attempting to store all possible ways of saying this or doing a word look-up, the dialog decision tree 10 abstracts probabilistic information from the buyer's input 26 for a set of training data 25. The probabilistic information for the training data 25 allows the mapping of a buyer's input 26 with the associated database data categories 30. In this
10 way, a dialog decision tree 10 is able to correctly categorize new sentences or sentence fragments. Advantageously, this provides a learning-based approach that allows for continuous improvement of a dialog decision tree's 10 ability to correctly match a buyer's request 26 with a database data category 30.

A buyer 24 may respond to the text dialog template 34 in a number of ways (step
15 192). For example, the buyer 24 may accept the suggestion contained in the text dialog 34 by answering with a positive response, such as "Yes", "OK", " Sounds Great", "Yeah", or the like. Buyer 24 may also reject the suggestion by answering with a negative response such as "No", " No, Thank You", "I Don't Think so", or the like. The dialog
· decision tree 10 maps the buyer's 24 response to a database of responses 37 to determine
20 whether a transition point has been reached (step 194). If the dialog decision tree 10 was able to map the buyer's 24 entry to a field in database 37 (step 196), the dialog decision tree 10 launches the next appropriate node along a predetermined branch of the dialog decision tree 10 (step 200). If the dialog decision tree 10 is unable to map the buyer's 24 response to a corresponding field in database 37, the dialog decision tree 10 prompts the
25 buyer 24 to clarify their prior input (step 198). The dialog decision tree 10 continues to prompt the buyer 24 with dialog text templates 34 until buyer 24 reaches a decision point (step 202). A decision point may be the point in which the buyer 24 decides to purchase offered goods or services, to stop and save the current product search for future reference, to search for other goods or services, or the like. When the buyer 24 reaches the
30 appropriate decision point (step 202) the buyer 24 exits the active dialog decision tree 10 (step 206).

By way of example, a sample set of database data categories 30 may be

represented by the symbol $C = \{YES, NO, BUY, MOTHER, FATHER, DETAILS\}$. To determine the appropriate database data category 30, or C, for a sentence that the buyer 24 types made up words, the dialog decision tree 10 uses a Bayesian theory that postulates the equation:

5
$$P(C|W) = \frac{P(W|C)P(C)}{P(W)}$$

The database data category 30, or C, that the dialog decision tree 10 associates with the buyer's input 26 is the one which maximizes the equation of $P(C|W)$.

Those skilled in the art will appreciate that the dialog decision tree may be
10 represented on a buyer's electronic display as an animated character or the like. Further, a dialog decision tree does not have to process a transaction, but may be used as a search assistant to present web site content in response to a visitor's natural language query. Moreover, a dialog decision tree may be able to search one or more databases owned or operated by other business entities in order to provide a buyer with a personal shopper
15 to compare price and availability of desired goods or services.

While the present invention has been described with reference to the above illustrated embodiments, those skilled in the art will appreciate that various changes in form and detail may be made without departing from the intended scope of the present invention as defined in, and differentiated by, the following claims.

Claims

What is claimed is:

1. A business method, comprising the steps of:
providing a business enterprise operating a web site with a dialog template
5 containing a plurality of predefined nodes; and
allowing the business enterprise to customize the dialog template to suit the
business enterprise's needs, wherein the dialog template provides a visitor of the web site
with an interactive text dialog for purchasing goods of the business enterprise.
2. The business method of claim 1 further comprising the step of modifying selected
10 nodes from the plurality of predefined nodes using an interactive utility, wherein the
interactive utility guides the business enterprise through the step of modifying a selected
node.
3. A method, comprising the steps of:
providing a web site with a dialog template containing a plurality of predefined
15 nodes; and
allowing a business enterprise to customize the dialog template to suit the
business enterprise's needs, wherein the dialog template provides a visitor of the web site
with an interactive text dialog for purchasing goods of the business enterprise.
4. The method of claim 3 further comprising the step of modifying selected nodes
20 from the plurality of predefined nodes using an interactive utility, wherein the interactive
utility guides the business enterprise through the step of modifying a selected node.
5. A method of building a dialog decision tree for practice in an electronic device,
the method comprising the steps of:
providing a first node for initiating a text dialog with an on-line buyer;
25 providing an end node for terminating the text dialog with the on-line buyer;
providing a network of nodes interconnected between the first node and the end

- node for continuing the text dialog until the end node is reached;
assigning each node within the network of nodes a node transition value; and
interpreting from the text dialog with the buyer the transition value, wherein the
transition value triggers the transition to another node within the network of nodes in
5 order to guide the buyer to the end node.
6. The method of claim 5 further comprising the step of associating the dialog
decision tree with a database, wherein the database provides data concerning goods for
sale.
7. The method of claim 5 further comprising the step of: providing a report
10 generator for tracking sales performance and product recommendations of a dialog
decision tree.
8. The method of claim 5 further comprising the step of: providing a module for
mining data in a database and a web site, wherein the module automatically links the
mined data to a dialog decision tree.
- 15 9. The method of claim 5 further comprising the step of: providing a specific dialog
decision tree and product recommendations based on historical buyer data.
10. The method of claim 5 further comprising the step of: updating the transition
value of a selected node in response to a favored transition value of the buyer, wherein
the favored transition value is a derivative form of the transition value.
- 20 11. In an electronic apparatus hosting a decision tree for delivering content in
response to a natural language request, a method comprising the steps of:
receiving a natural language request for content;
matching the natural language request to the content; and
determining an appropriate activity for response.
- 25 12. The method of claim 11, wherein the appropriate activity is providing a natural

language response requesting additional input.

13. The method of claim 11, wherein the appropriate activity is transitioning to another node on the decision tree.

14. The method of claim 11, wherein the content are goods available for purchase.

5 15. A business method, comprising the steps of:

providing a business enterprise with a computer-readable medium holding computer executable instructions to develop and maintain an interactive web-based finite state machine, wherein the finite state machine is graphically represented by an interactive web-based dialog decision tree that can prompt a user for input during

10 development, maintenance and use of the finite state machine; and

receiving payment for providing the computer-readable medium.

16. The business method of claim 15 further comprising the step of providing a partitioned window to develop and maintain an interactive web-based dialog decision tree, wherein a first window provides an interface to display data associated with a
15 selected node of the interactive web-based dialog decision tree and a second window to provide a graphical representation of the interactive dialog decision tree.

17. The business method of claim 15 further comprising the steps of providing an interactive web-based natural language query for active natural language dialog between a user and the interactive web-based dialog decision tree, wherein the user's natural
20 language input is normalized into a data element; and

mapping the data element to a desired database category based on a historical database of natural language queries.

18. The business method of claim 15 further comprising the step of providing an interactive utility to guide a user in the development and the maintenance of an
25 interactive web-based dialog decision tree.

19. The business method of claim 15 further comprising the step of providing the business enterprise with a computer-readable medium holding computer executable instructions for generating management reports.
20. The business method of claim 15 further comprising the step of providing the
5 business enterprise with a computer-readable medium holding computer executable instructions for analyzing how users navigate the dialog decision trees, wherein results of the analysis determines the user's future interactions with the dialog decision tree.
21. The business method of claim 15 further comprising the step of providing a
10 plurality of business enterprises with a computer-readable medium holding computer executable instructions to develop and maintain an interactive web-based dialog decision tree through a web-enabled interface.
22. A method for selecting desired web server content, comprising the steps of:
15 providing an interactive dialog decision tree for navigating a web server; providing web server content using a graphical user interface, wherein the interactive dialog decision tree prompts a user for a response until the desired web server content is selected.
23. The method of claim 22 wherein the desired web server content concerns web content from a plurality of web servers.
24. The method of claim 22 wherein the interactive dialog decision tree prompt is a text dialog box.
- 20 25. The method of claim 22 wherein the interactive dialog decision tree prompt provides a video format.
26. The method of claim 22 wherein the interactive dialog decision tree prompt provides an audio format.
27. The method of claim 22 wherein the interactive dialog decision tree is a graphical

representation of a finite state machine, wherein a node on the interactive dialog decision tree represents a state in the finite state machine.

28. The method of claim 22 further comprising the step of providing a semantics module for creation of a data element from a user's natural language response to the interactive dialog decision tree, wherein a probabilistic prediction based on a database of historical user responses maps the data element to a corresponding node on the interactive dialog decision tree.

29. The method of claim 22 further comprising the step of providing an analysis module for analyzing how users navigate the dialog decision trees, wherein the analysis module determines the user's future interactions with the dialog decision tree.

30. The method of claim 22 further comprising the step of providing an event calendar for selecting desired web server content, wherein the event calendar promotes server content that relates to an occasion.

31. The method of claim 22 further comprising the step of providing an e-mail generator for generating e-mail to selected users, wherein the e-mail generator generates e-mail based on promotional events.

32. In a computer system, a method for developing and maintaining an interactive web-based dialog decision tree, the method comprising the steps of:

providing an interactive finite state machine having a plurality of states where each state represents an interactive decision point;

providing a graphical user interface for accessing the interactive finite state machine;

providing an interactive utility for development and maintenance of the interactive finite state machine;

determining for each of the plurality of states a first set of links to a first database using the interactive utility, wherein the first set of links allow for retrieval of local web site content for display on an electronic device;

determining for each of the plurality of states a second set of links to a plurality of remote web servers using the interactive utility, wherein the second set of links allow for retrieval of remote web content for display on the electronic device;

5 providing each of the plurality of states with a text string for use in an interactive communication with a user the computer system; and

providing a normalization module for categorization of the user's natural language input at each of the plurality of states wherein the categorization of the user's input determines when to transition from one state to another and which database to access from amongst the plurality of databases.

10 33. The method of claim 32 wherein the method further comprising the step of providing a link at each of the plurality of states to a third database for accessing user specific data.

34. The method of claim 32 wherein the finite state machine concerns a graphical representation of a dialog decision tree.

15 35. The method of claim 32 wherein the graphical user interface concerns a partitioned window for simultaneous display of a graphical representation of the finite state machine and data that concerns a selected state in the finite state machine.

36. The method of claim 32 wherein the method further comprising the step of providing an interactive utility for integrating user supplied data with pre-constructed
20 finite state machine queries.

37. The method of claim 32 wherein the method further comprising the step of providing multiple finite state machines.

38. The method of claim 37 wherein the method further comprising the step of providing the finite state machines in a user-defined hierarchical order.

25 39. The method of claim 32 wherein the method further comprising the step of

providing a first statistical characterization module for determining a probabilistic transition from one node to another based on historical preferences of a selected user.

40. The method of claim 32 wherein the method further comprising the step of providing a second statistical characterization module for determining a probabilistic transition from one node to another based on a plurality of user responses to a particular interactive dialog decision tree prompt.

41. The method of claim 32 wherein the method further comprising the step of providing a report generator for generating user defined reports.

42. The method of claim 32 wherein the method further comprising the step of providing an analysis module for analyzing how users navigate the dialog decision trees, wherein the analysis module determines the user's future interactions with the dialog decision tree.

43. A computer system, comprising:
means for providing a finite state machine having an interactive interface for retrieval of information;
means for receiving a request for information retrieval from a second computer system;
means for retrieving the requested information based on a statistical analysis of the request; and
means for forwarding to the second computer the retrieved information using the interactive interface of the computer system, wherein the interactive interface actively prompts a user of the second computer for input concerning the retrieved information to determine whether additional information retrieval is necessary.

44. The computer system of claim 43 wherein the finite state machine is represented by a graphical dialog decision tree.

45. The computer system of claim 43 wherein the interactive interface is a graphical

user interface.

46. The computer system of claim 45 wherein the graphical user interface includes a natural language query.
47. The computer system of claim 43 wherein the means for receiving a request for
5 information retrieval is a communication link.
48. The computer system of claim 47 wherein the communication link is an Internet link.
49. The computer system of claim 43 wherein the means for retrieving the requested information is an embedded link.
- 10 50. The computer system of claim 43 wherein the means for retrieving the requested information is a Structured Query Language (SQL) module.
51. The computer system of claim 43 wherein the statistical analysis concerns a mapping of a user's response to a database storing a plurality of historical requests for information.
- 15 52. The computer system of claim 43 further comprising a first database for storing user preferences.
53. The computer system of claim 43 further comprising a second database for storing the data that concerns the information request.
54. The computer system of claim 43 further comprising a third database for storing
20 data concerning natural language responses to a user's request for information.
55. The computer system of claim 43 further comprising an analysis module for analyzing how users navigate the dialog decision trees, wherein the analysis module

determines the user's future interactions with the dialog decision tree.

56. The computer system of claim 43 further comprising an event module for selecting desired web server content based on a calendar marked with special occasions, wherein the event module promotes server content that relates to a special occasion.

5 57. The computer system of claim 43 further comprising an e-mail generator for generating e-mail for selected user's, wherein the e-mail generator generates e-mail based on promotional events.

58. For a computer system having a web server, a computer-readable medium holding computer executable instructions for performing, a method for searching the web server
10 comprising the steps of:

providing an interactive dialog decision tree for navigating the web server;

providing the web server content using a graphical user interface, wherein the interactive dialog decision tree prompts a user for a response until a user terminates the search.

15 59. The computer-readable medium of claim 58 wherein the desired web server content concerns web content from a plurality of servers.

60. The computer-readable medium of claim 58 wherein the prompt for a user response is a text dialog box.

61. A computer-readable medium of claim 58 wherein the prompt for a user response
20 includes a video format.

62. The computer-readable medium of claim 58 wherein the prompt for a user response includes an audio format.

63. The computer-readable medium of claim 58 wherein the interactive dialog decision tree is a finite state machine where a node on the interactive dialog decision tree

represents a state in the finite state machine.

64. The computer-readable medium of claim 58 further comprising the step of providing a semantics module for creation of a data element from a user's response, wherein a probabilistic prediction based on a database of historical user responses maps
5 the data element to a corresponding node on the interactive dialog decision tree.

65. The computer-readable medium of claim 58 further comprising the step of providing an analysis module for analyzing how users navigate the dialog decision trees, wherein the analysis module determines the user's future interactions with the dialog
decision tree.

FIG. 1

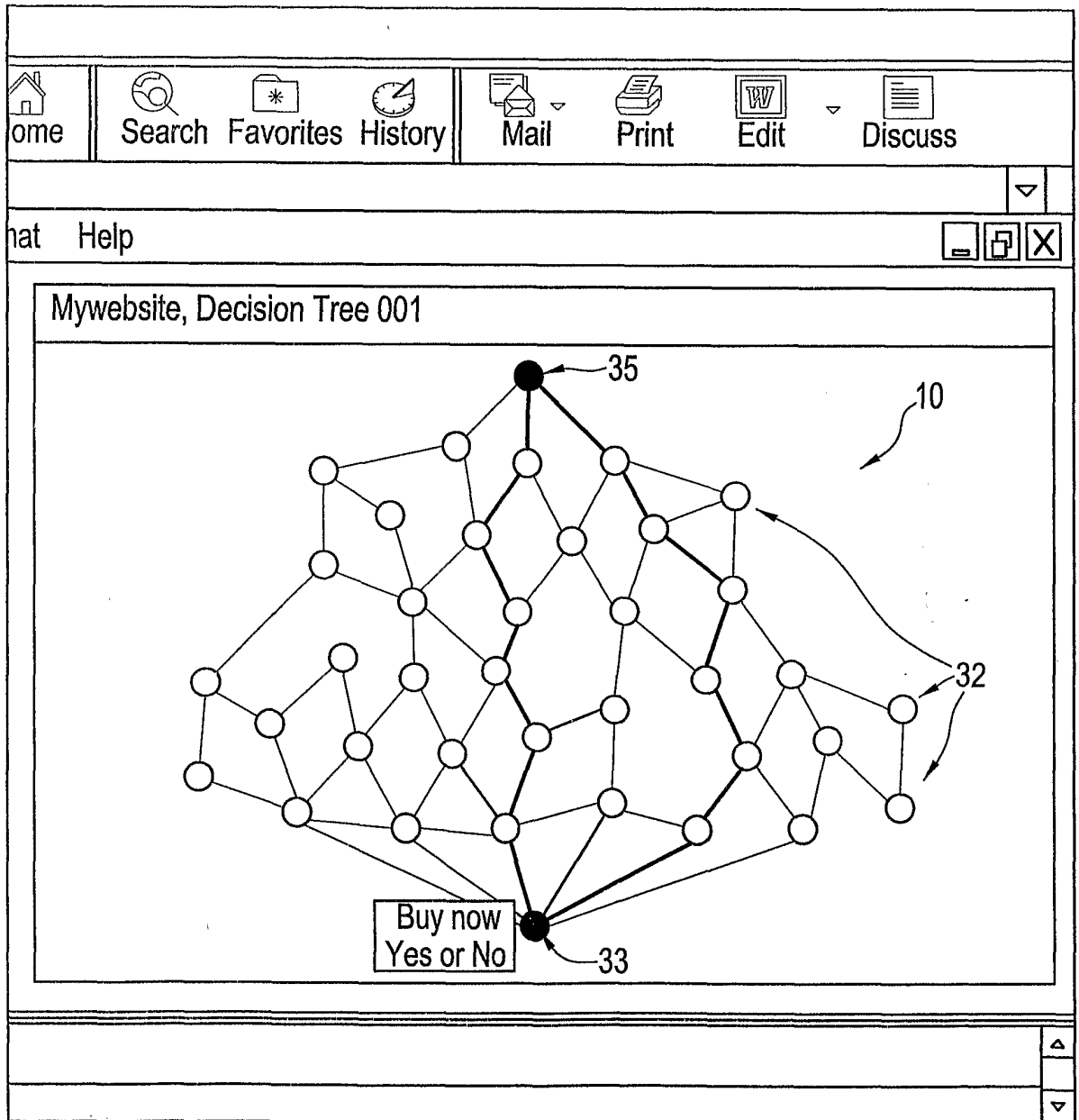


FIG. 2

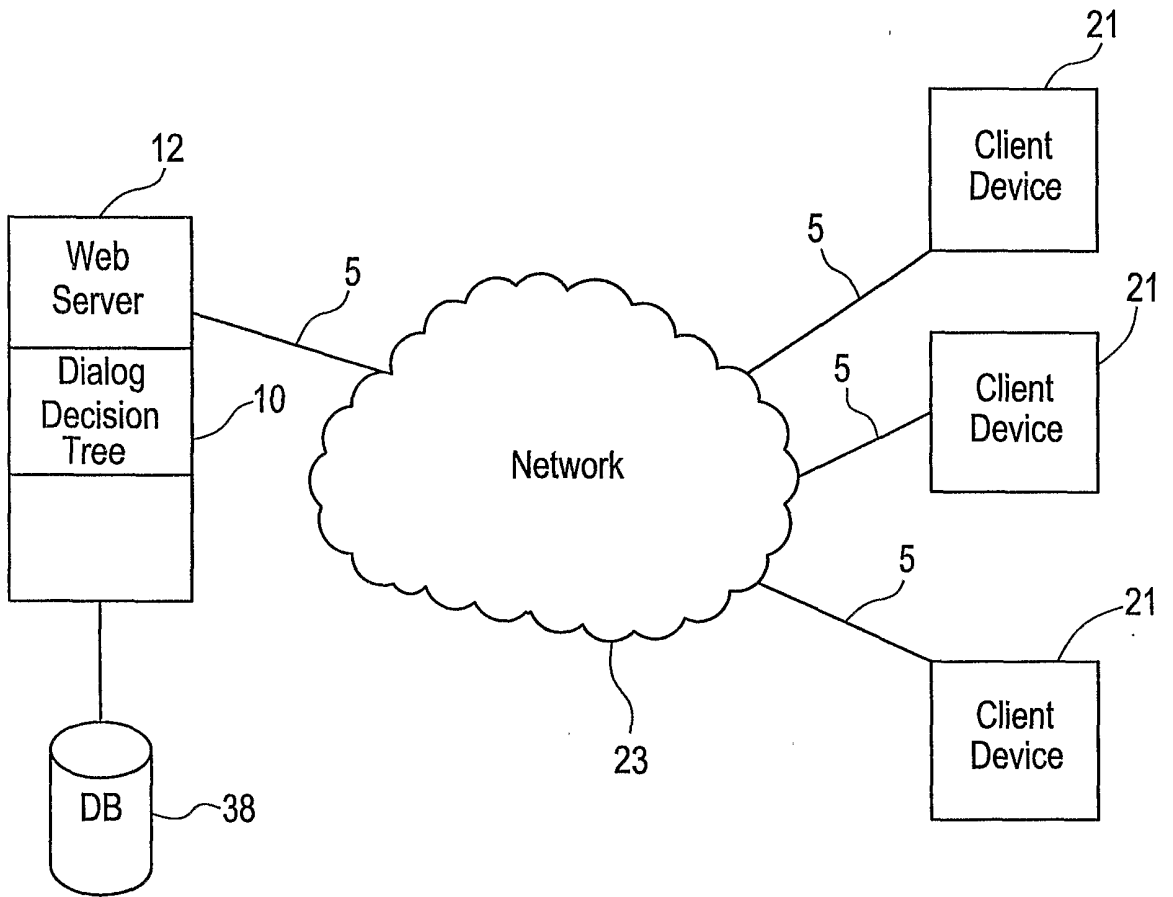


FIG. 3

54

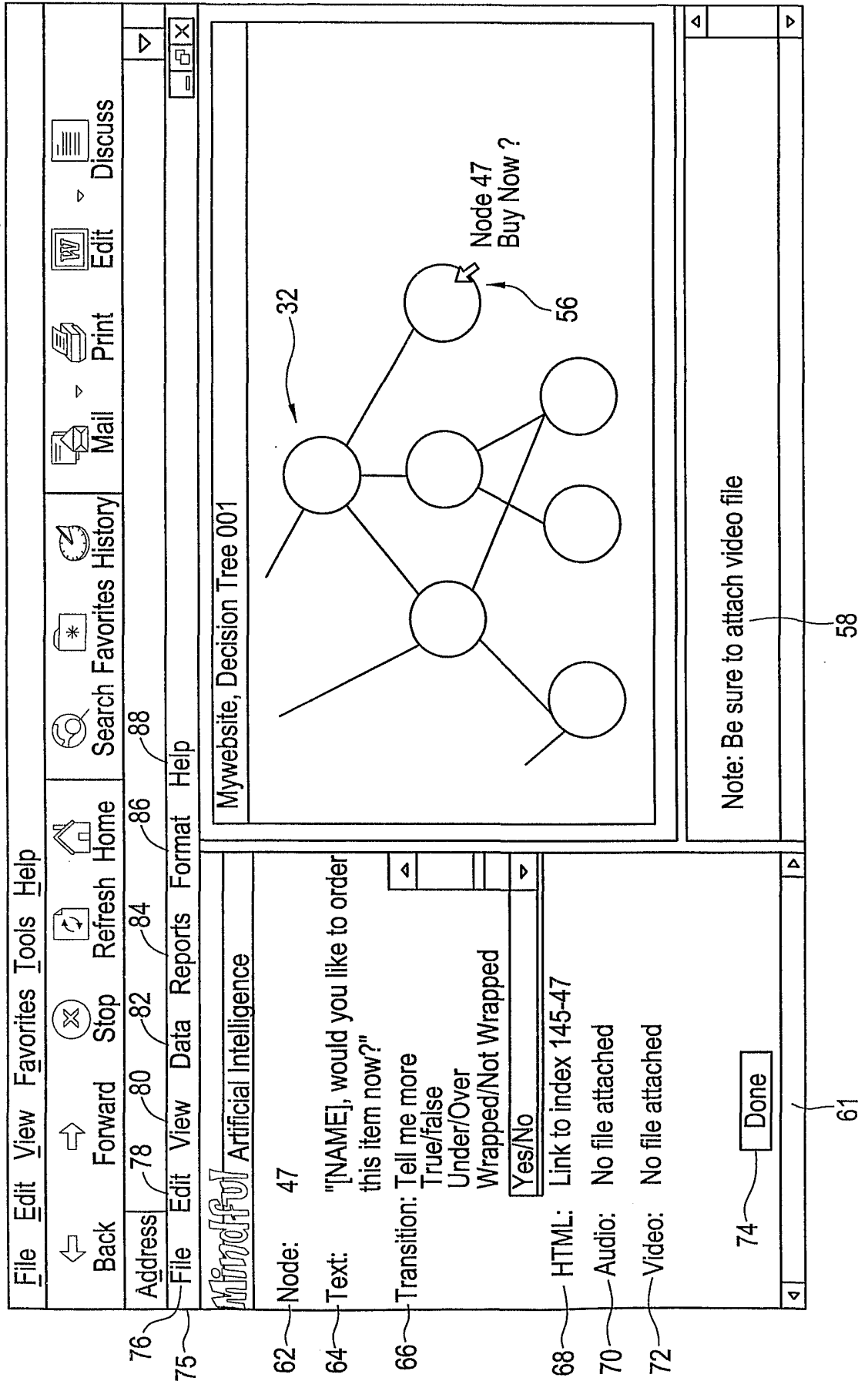


FIG. 4

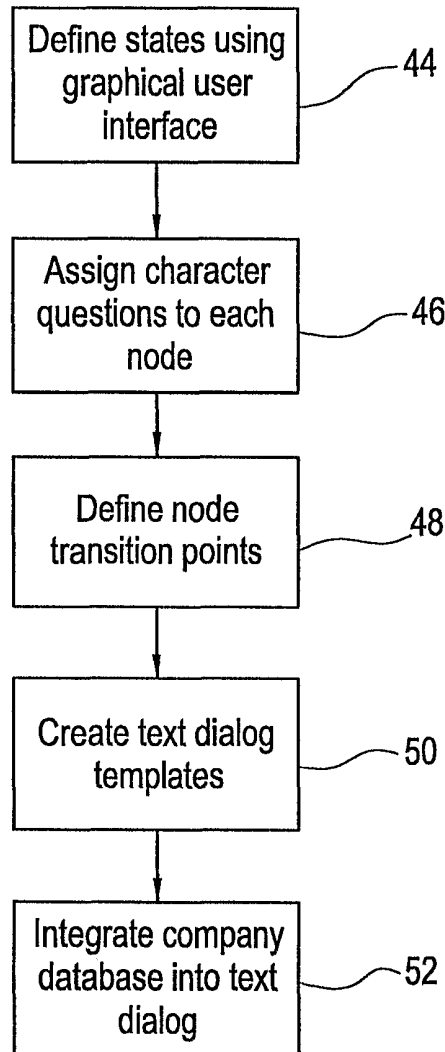


FIG. 5

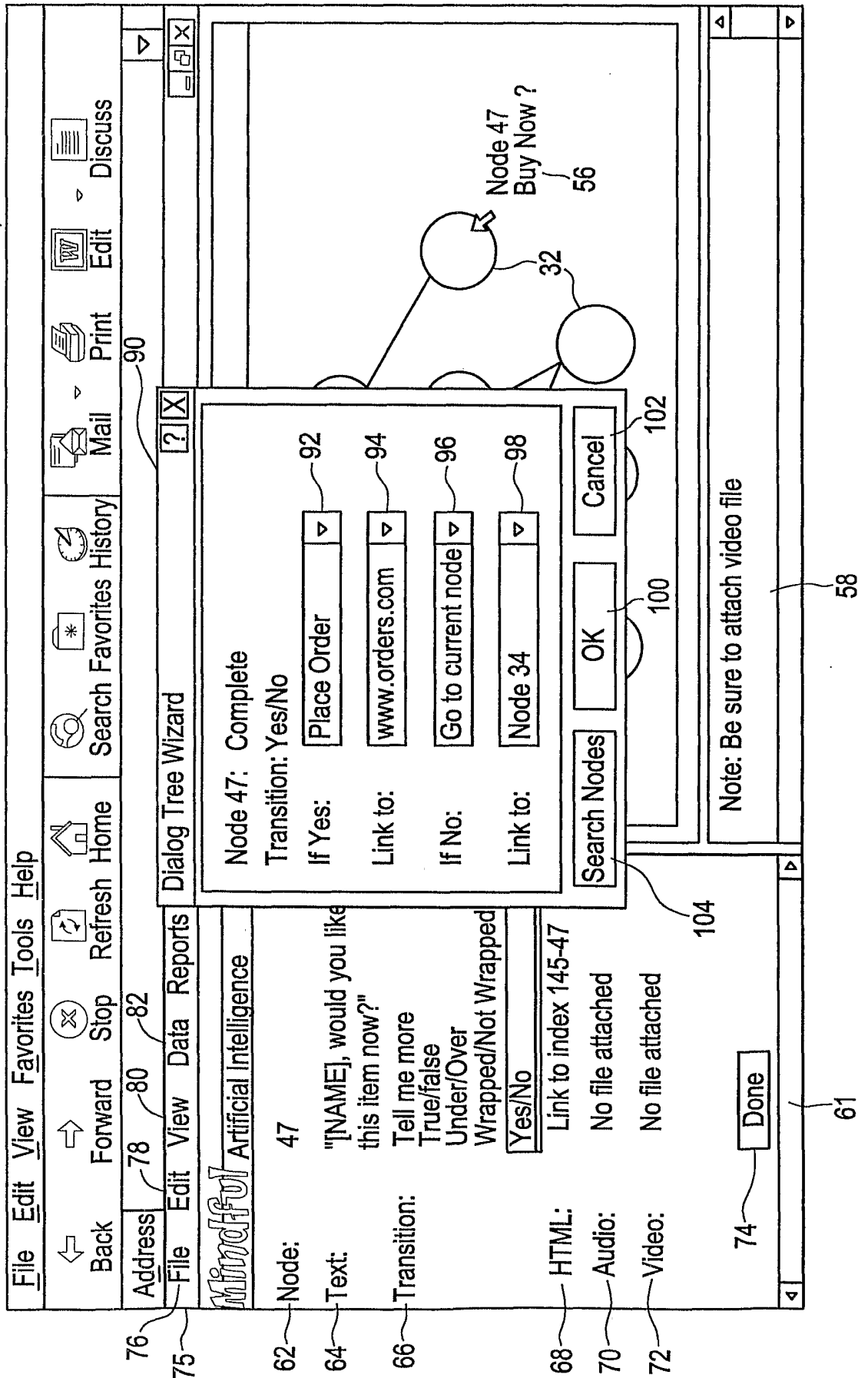


FIG. 6

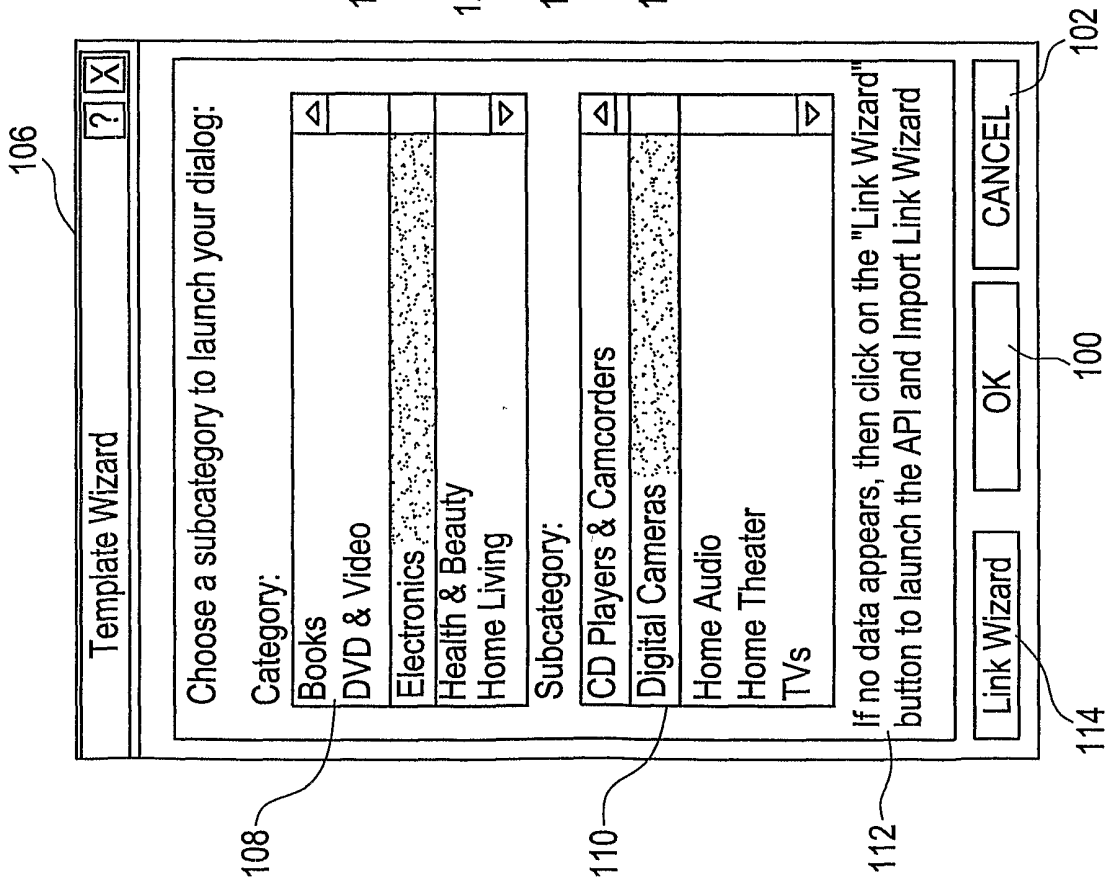


FIG. 7

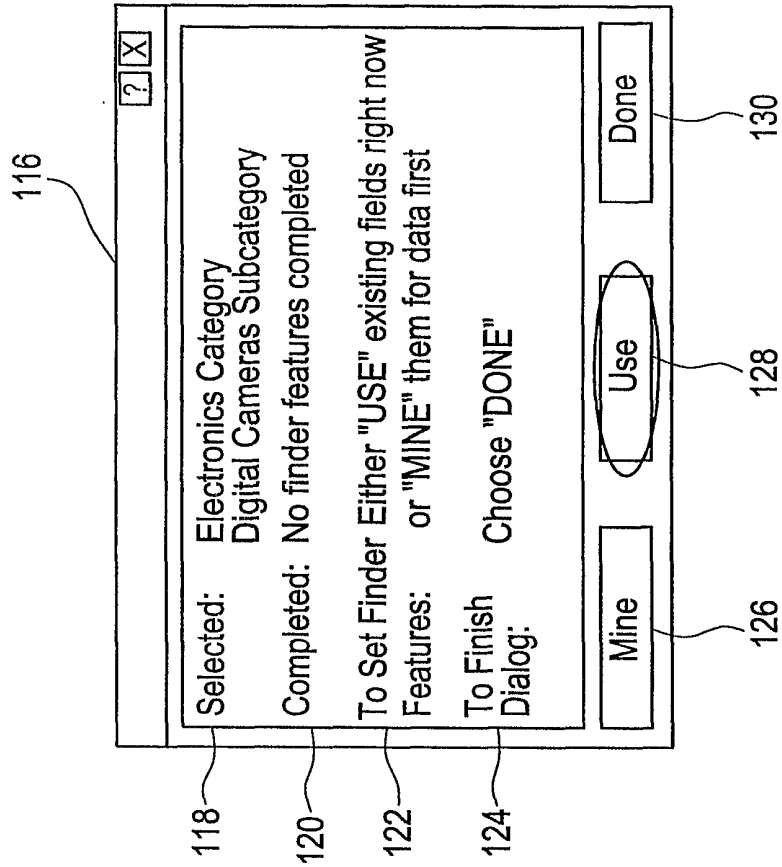


FIG. 8

132

Template Wizard

112 Choose an existing field to create a Finder Feature:

118 Selected: Electronics Category
Digital Cameras Subcategory

SKU	
Description Level 1	
Description Level 2	
Price	
Vendor	

134

136 How many options would you like to break this field into? 3

This Finder Feature is called:

138 Price

140 This feature is important because: (Optional)

100 OK

102 CANCEL

FIG. 9

142

Template Wizard

144 Finder Feature: Price

146 Option: 1 of 3

Define the range of this option:

\$199.99	
\$299.00	
\$599.99	
\$749.99	
\$899.00	

148

112 Enter in a name for this option (such as low, medium or high, 0-50 or 50-100, etc.)

150 up to \$299

100 OK

102 Cancel

FIG. 10

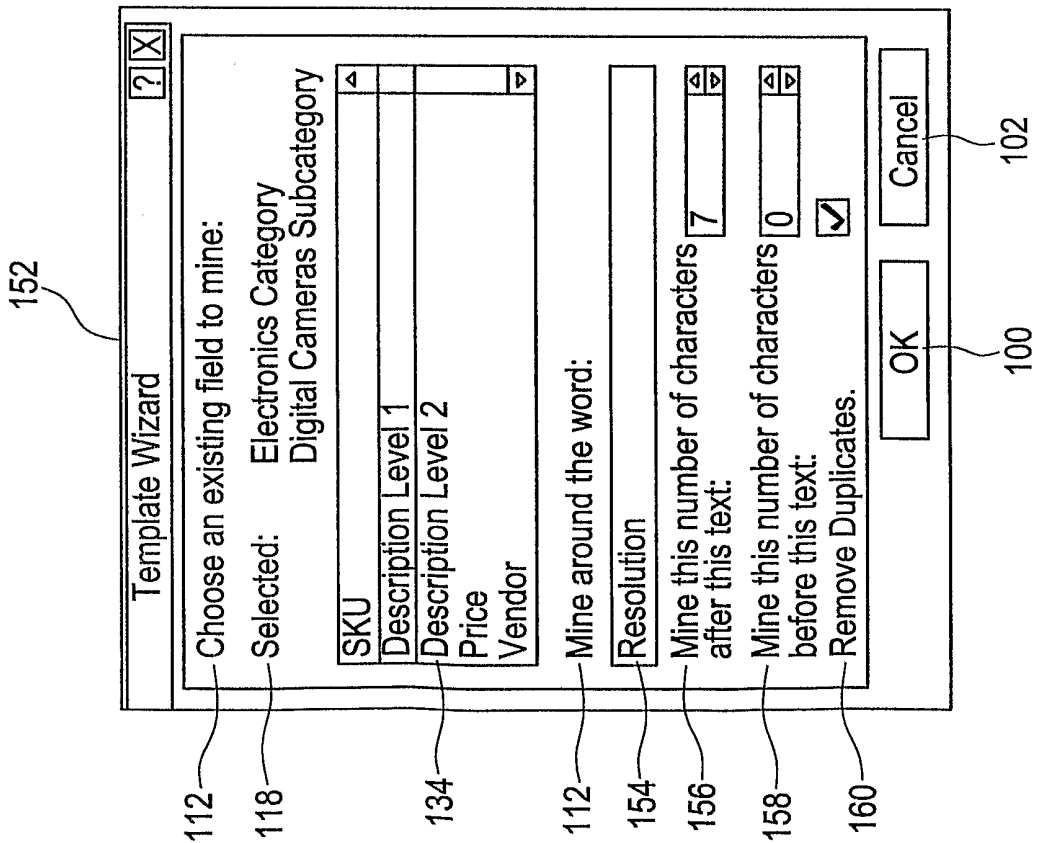


FIG. 11

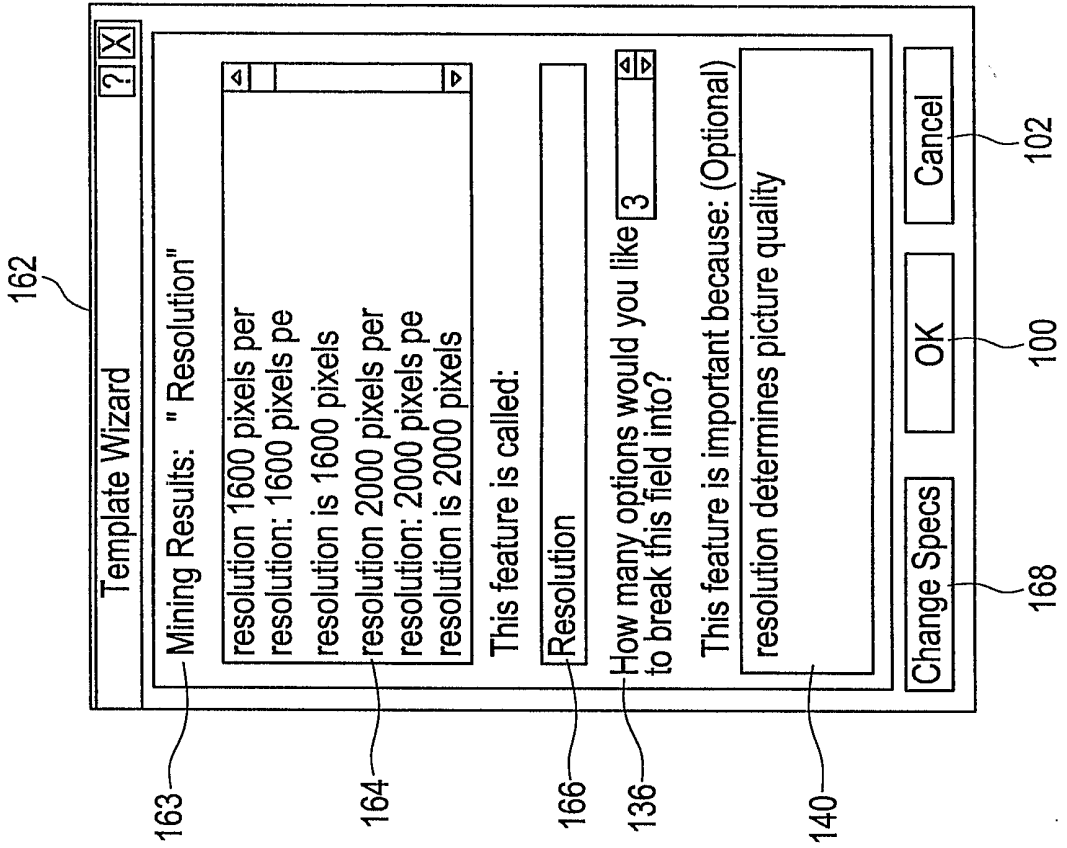
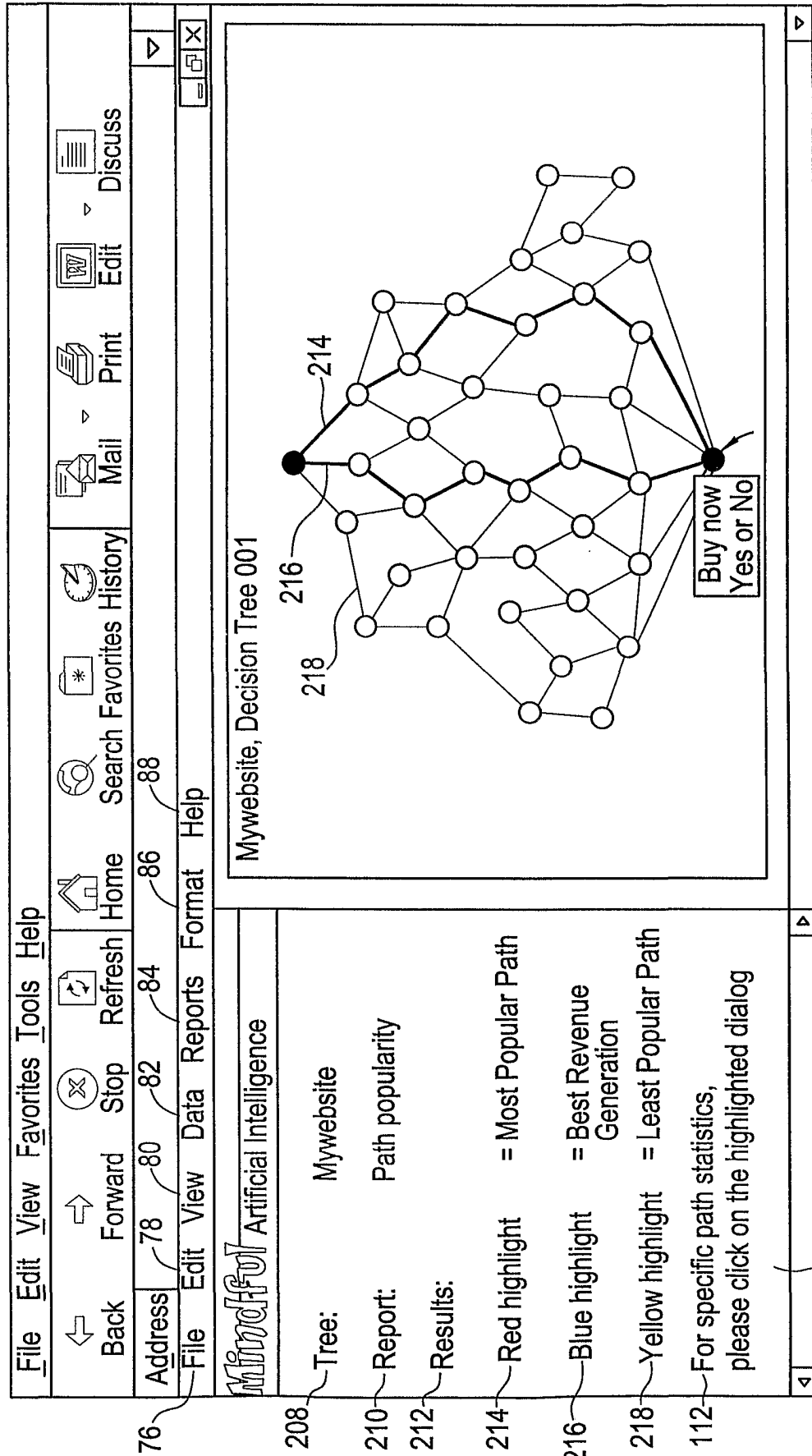


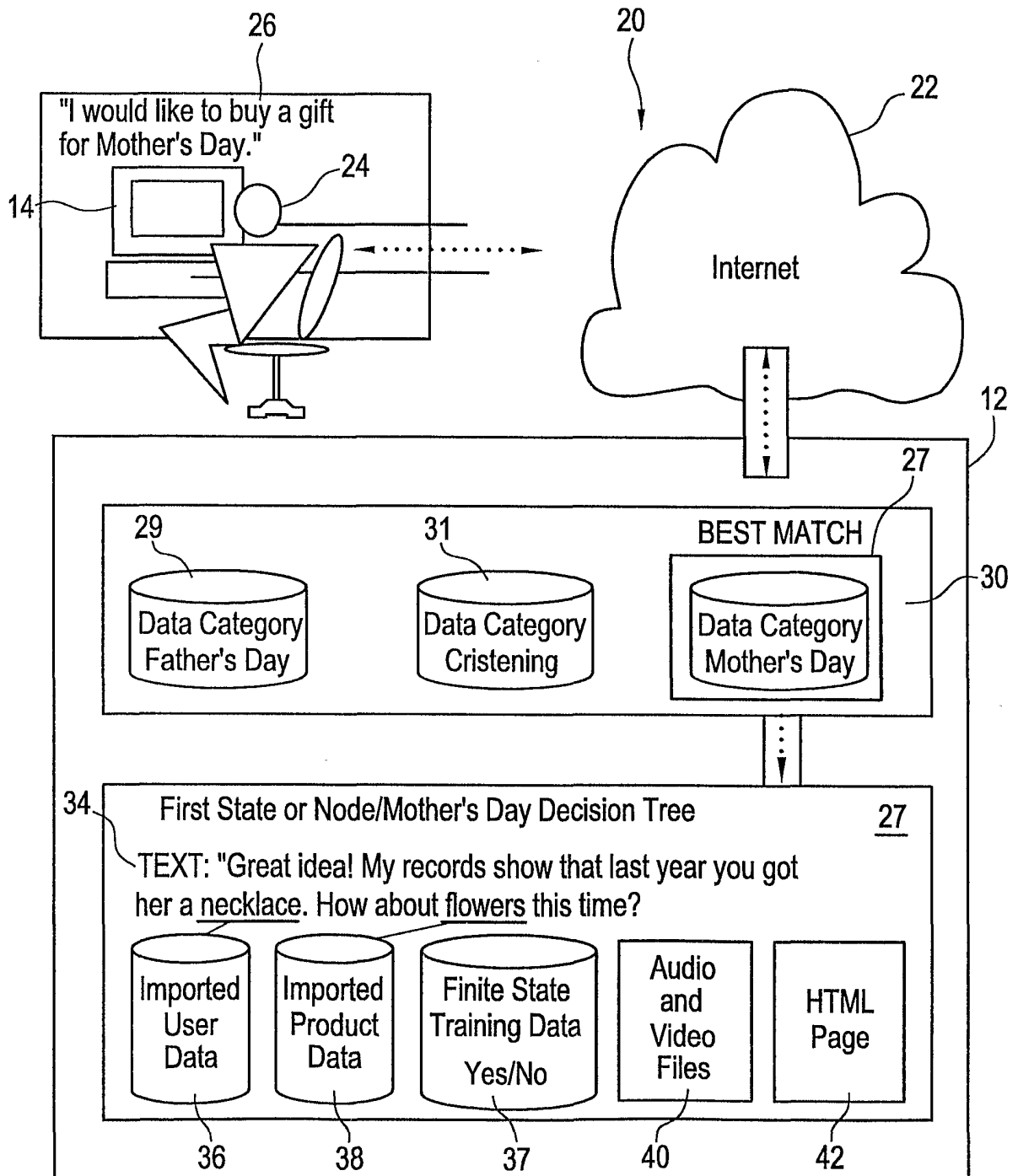
FIG. 12

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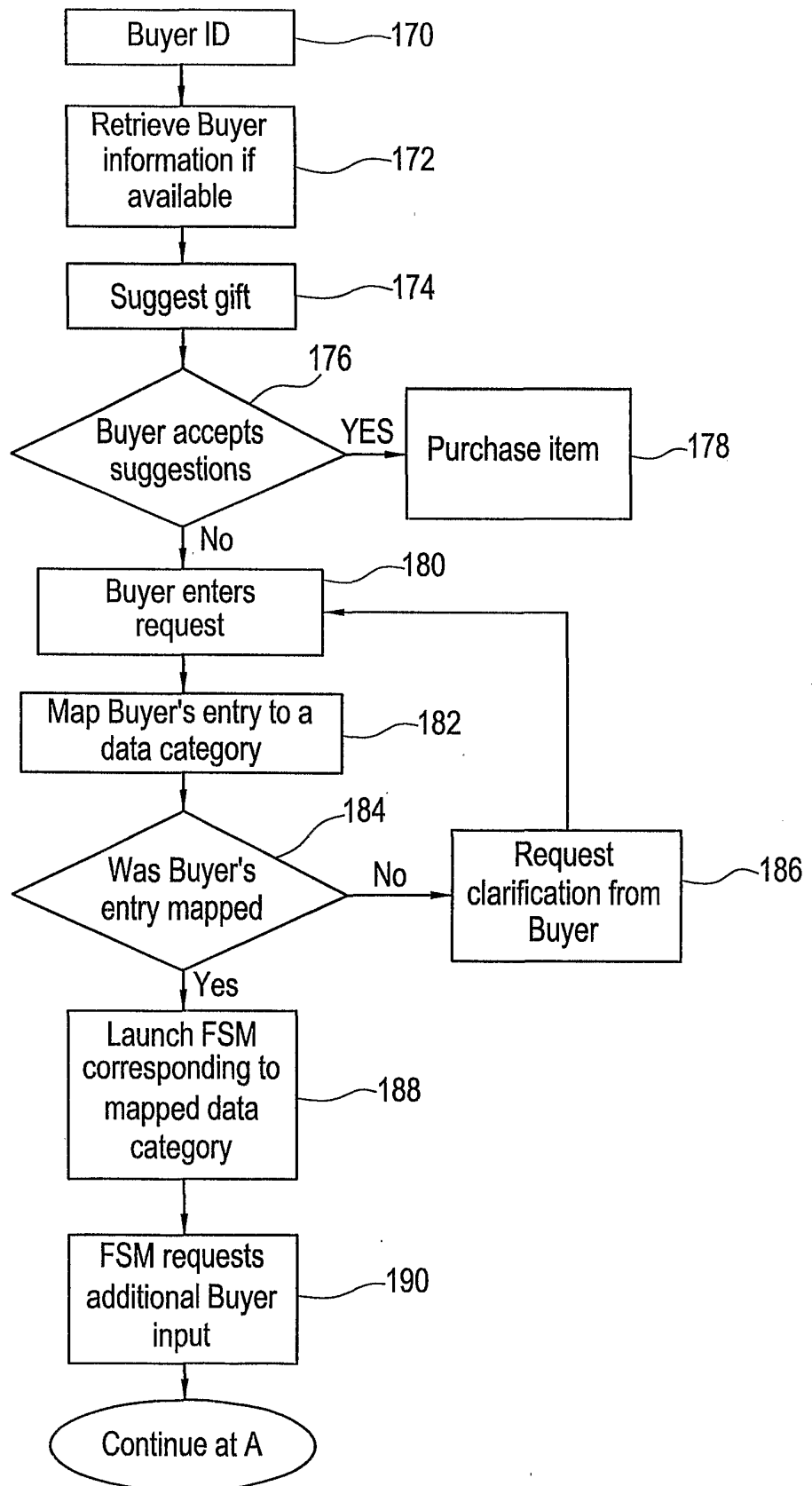
59

FIG. 13



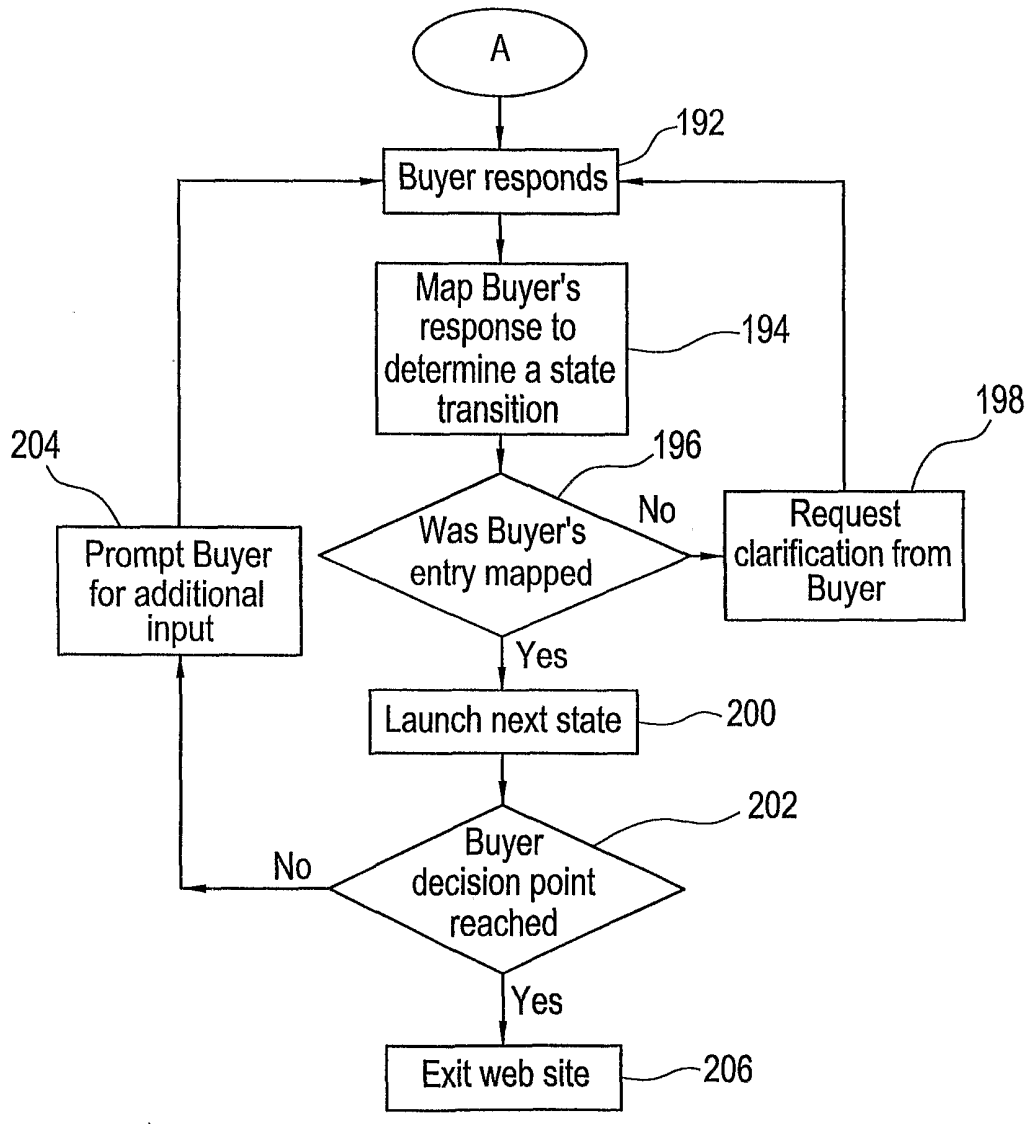
11/12

FIG. 14



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FIG. 15



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/25100

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/60
US CL :705/26

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. : 705/26

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	US 5,983,200 A (SLOTZNICK) 09 November 1999, col. 14, lines 10-60	5,11,22,58

Further documents are listed in the continuation of Box C. 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
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"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
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Date of the actual completion of the international search

22 SEPTEMBER 2001

Date of mailing of the international search report

02 NOV 2001

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