



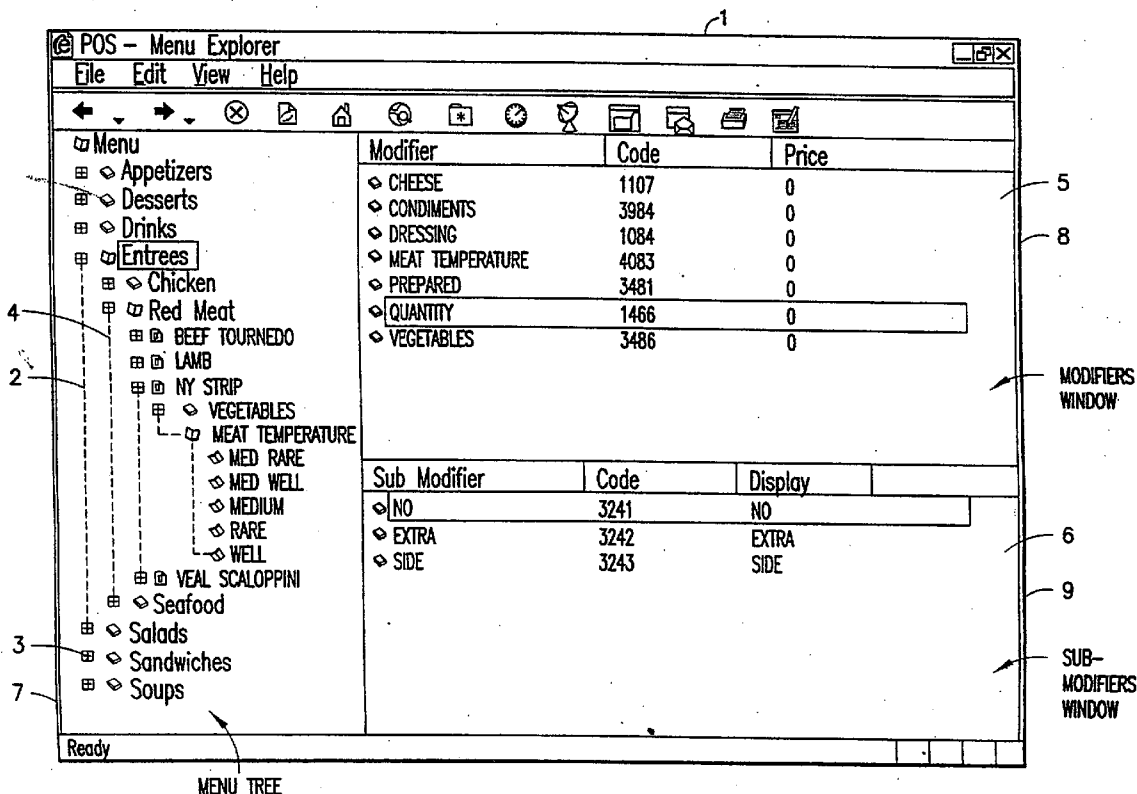
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(19) **United States**(12) **Patent Application Publication**
McNally(10) **Pub. No.: US 2006/0195510 A1**(43) **Pub. Date: Aug. 31, 2006**(54) **INFORMATION MANAGEMENT AND
SYNCHRONOUS COMMUNICATIONS
SYSTEM****Publication Classification**(51) **Int. Cl.**
G06F 15/16 (2006.01)(52) **U.S. Cl.** **709/203**(76) **Inventor: Keith R. McNally, San Diego, CA**
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New York, NY 10281-2101 (US)(21) **Appl. No.: 11/352,126**(22) **Filed: Feb. 10, 2006****Related U.S. Application Data**

(63) Continuation-in-part of application No. 11/190,633, filed on Jul. 26, 2005, which is a continuation-in-part of application No. 11/112,990, filed on Apr. 22, 2005, which is a continuation of application No. 10/016,517, filed on Nov. 1, 2001, now Pat. No. 6,982,733, which is a continuation-in-part of application No. 09/400,413, filed on Sep. 21, 1999, now Pat. No. 6,384,850.

(57) **ABSTRACT**

An information management and synchronous communications system and method facilitates database equilibrium and synchronization with wired, wireless and Web-based systems, user-friendly and efficient generation of computerized menus and reservations with handwritten/voice modifications for restaurants, enrollment sessions, and other applications that utilize equipment with nonstandard graphical formats, display sizes and/or applications for use in remote data entry, information management and communication with host computer, digital input device or remote pager via standard hardwired connection, the internet, a wireless link, printer or the like. Various operations employing automated telephone calls and/or messaging may, for instance, be performed. For example, desired reservation and/or appointment information may be automatically converted and conveyed to one or more entities via automated telephone call and/or messaging. As another example, information regarding reservation acceptability may be received and automatically converted via automated telephone call and/or messaging. Telephones may, for instance, be the only equipment required by the entities.



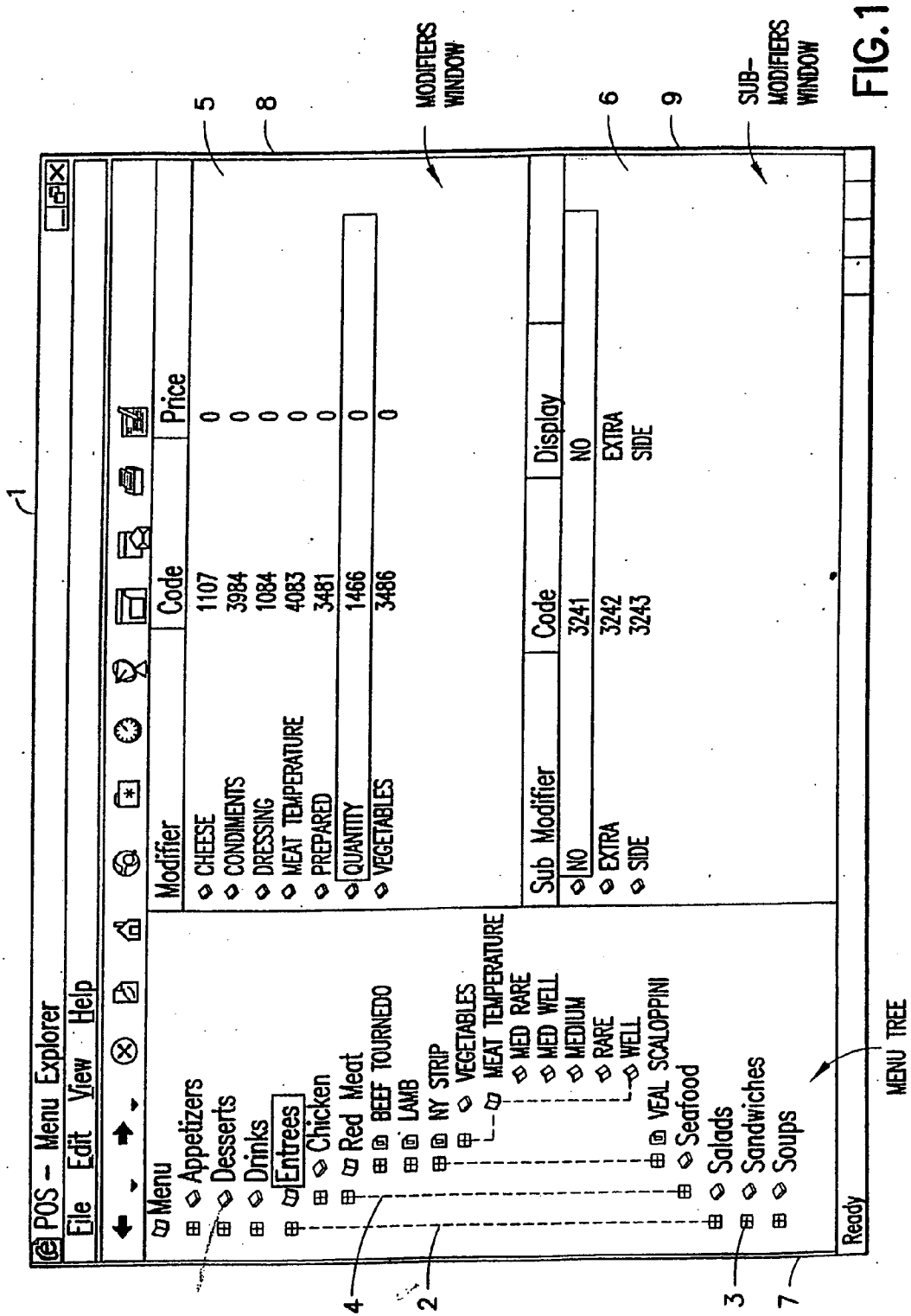


FIG. 1

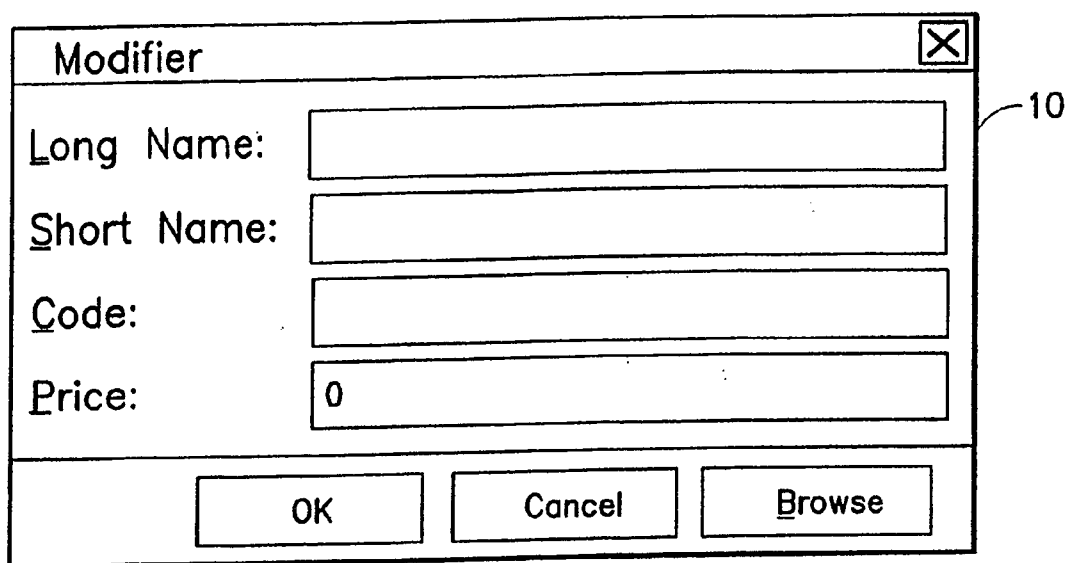


FIG. 2 is a screenshot of a software dialog box titled "Modifier". The dialog box has a standard Windows-style title bar with a close button (X) in the top right corner. The main area of the dialog contains four labeled text input fields stacked vertically: "Long Name:", "Short Name:", "Code:", and "Price:". The "Price:" field contains the number "0". At the bottom of the dialog, there are three buttons: "OK", "Cancel", and "Browse". A reference numeral "10" is positioned to the right of the dialog box, pointing to its right edge.

FIG. 2

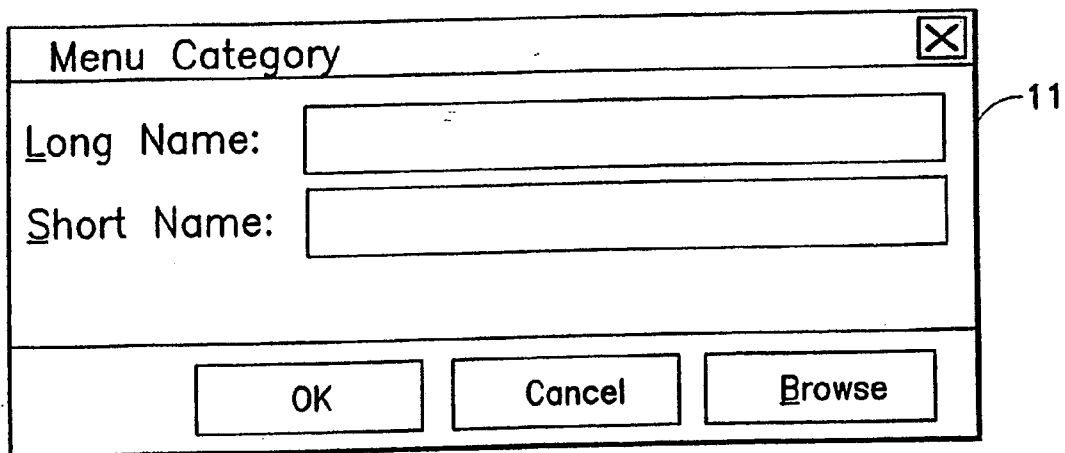


FIG. 3 is a screenshot of a software dialog box titled "Menu Category". The dialog box has a standard Windows-style title bar with a close button (X) in the top right corner. The main area of the dialog contains two labeled text input fields stacked vertically: "Long Name:" and "Short Name:". At the bottom of the dialog, there are three buttons: "OK", "Cancel", and "Browse". A reference numeral "11" is positioned to the right of the dialog box, pointing to its right edge.

FIG. 3

12

Menu Item

×

Long Name:

Chicken Alaska

Code:

5612

Short Name:

ChxAls

Price:

12.95

Prep. Time:

12

Recipe

◀

Flame broiled brandy marinated Tender Chicken Breast topped with a creamy cilantro sauce. Served with steamed broccoli, carrots and zucchini.

Spices include lemon pepper, paprika, ginger.

▶

OK

Cancel

Browse

FIG.4

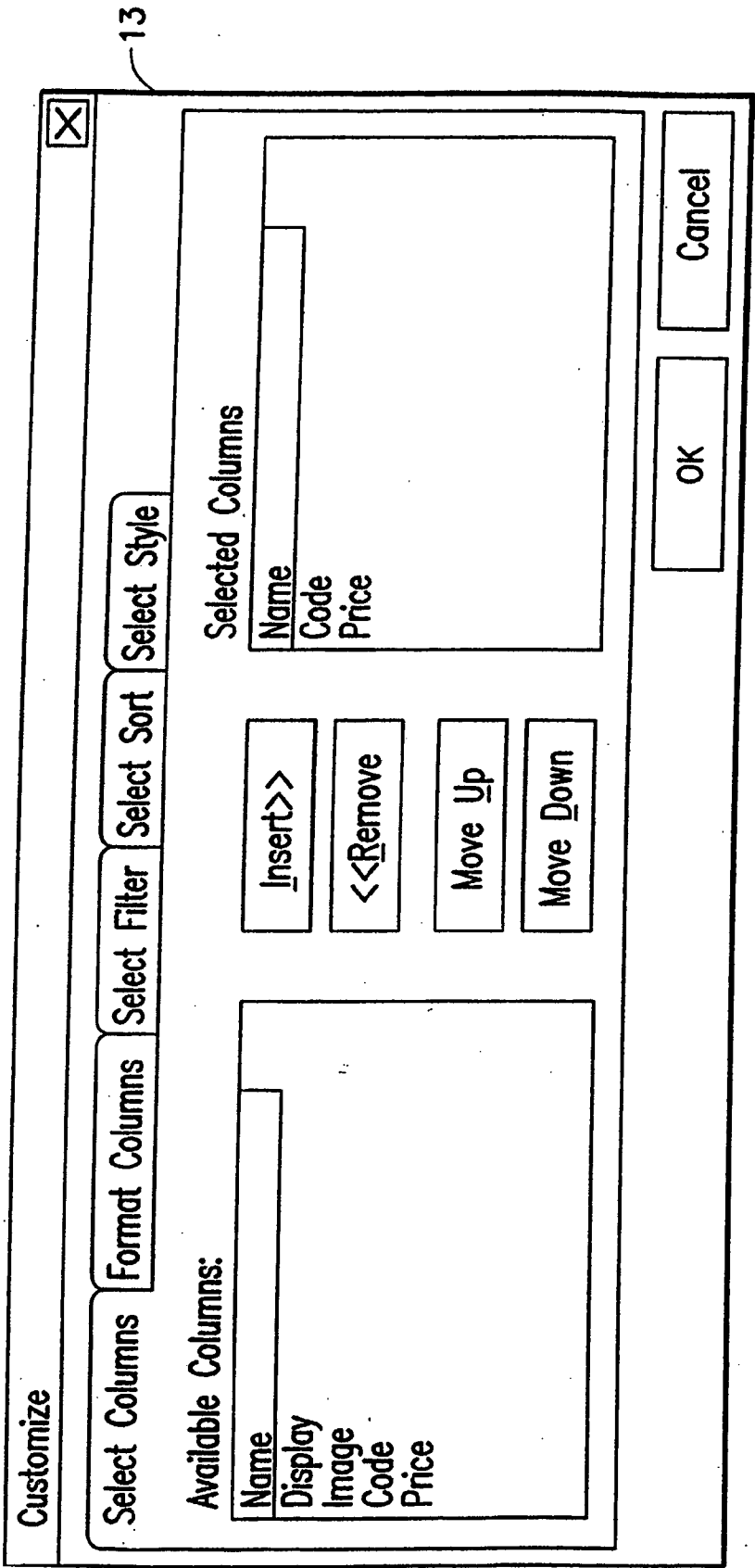


FIG.5

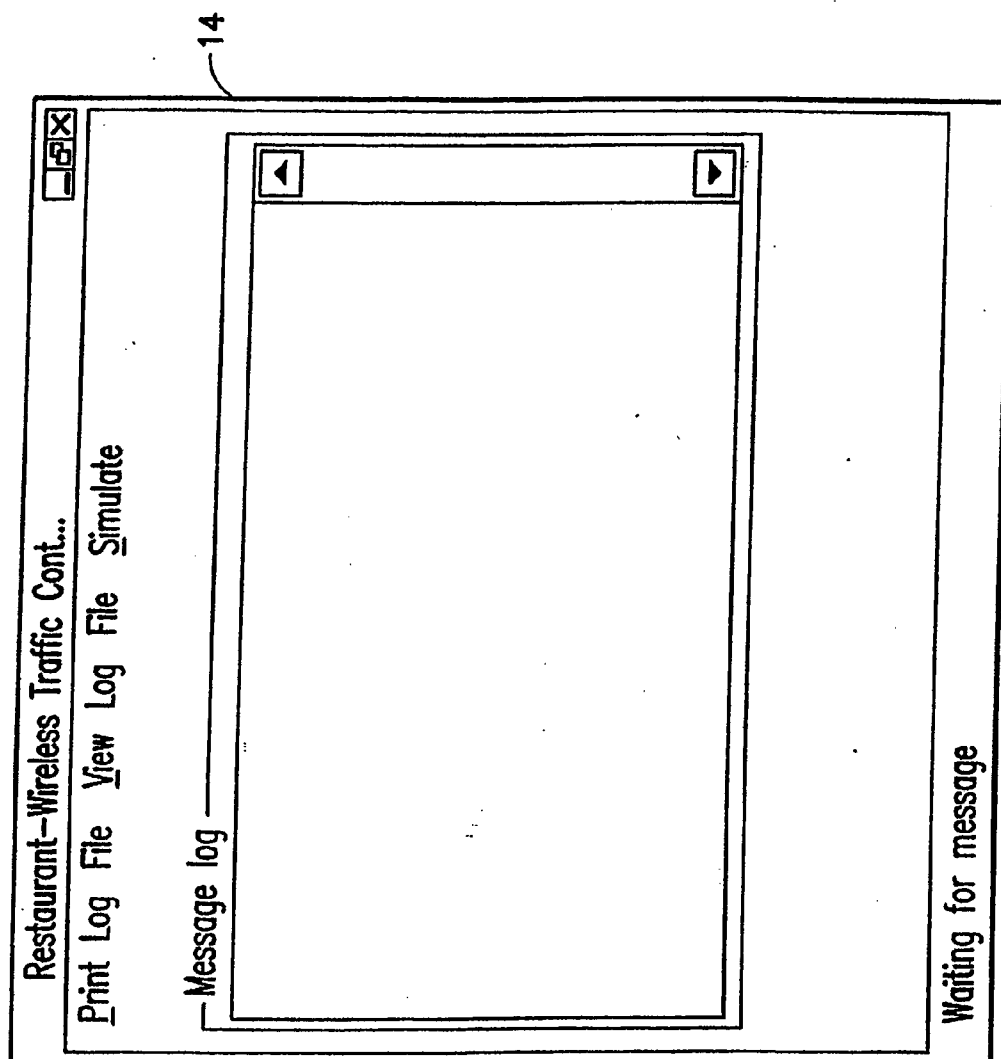


FIG. 6

X
POSce-System

Login
CHECKS
ORDER
VIEW
PAY

Choose Item:

App

Dessert

Entrees

Salads

Sdwch

Soups

Tbl67 5st 2

Direction:

MAIN
PREV
PAGE
MODS

Select Guest to Order for:

1

2

Last Selection

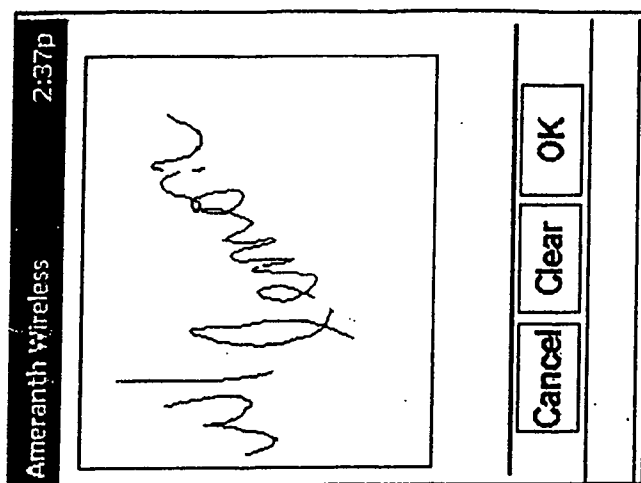
OK

Cancel

Browse

REMOVE LAST

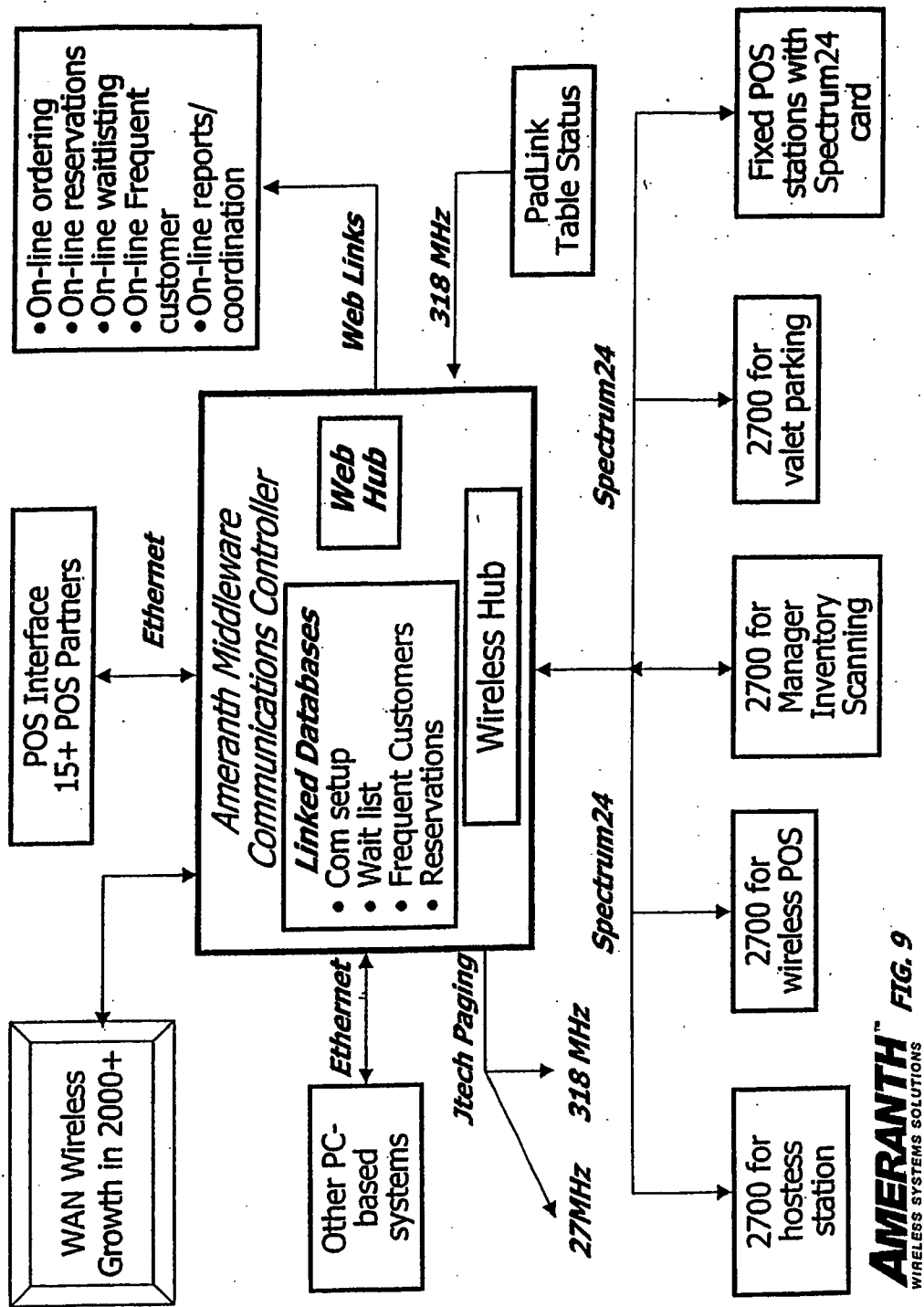
FIG. 7



This is an example of the ordering
"Literal Screen".

FIG. 8

Ameranth 21st Century Communications Integration



AMERANTH™ FIG. 9
WIRELESS SYSTEMS SOLUTIONS

Ameranth 21st Century Communications Integration With "Conversion" Technologies

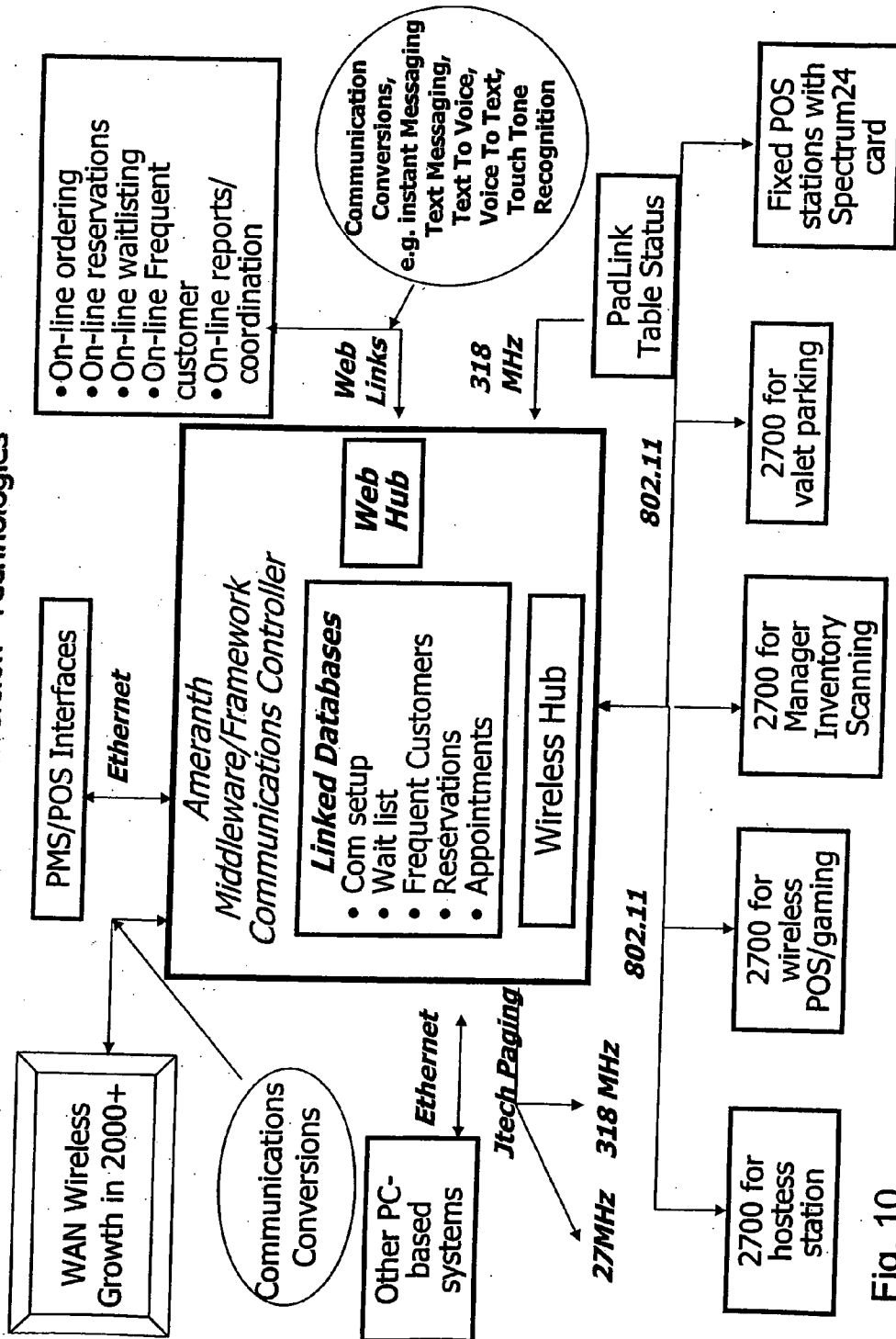


Fig. 10

1107

1109

1113

1115

1117

1119

1121

1123

1125

1127

1129

1131

1101

1103

1105

1135

1137

1139

1141

1143

1145

1147

1149

1101

1103

1105

1135

1137

1139

1141

1143

1145

1147

1149

1101

1103

1105

Fig. 11

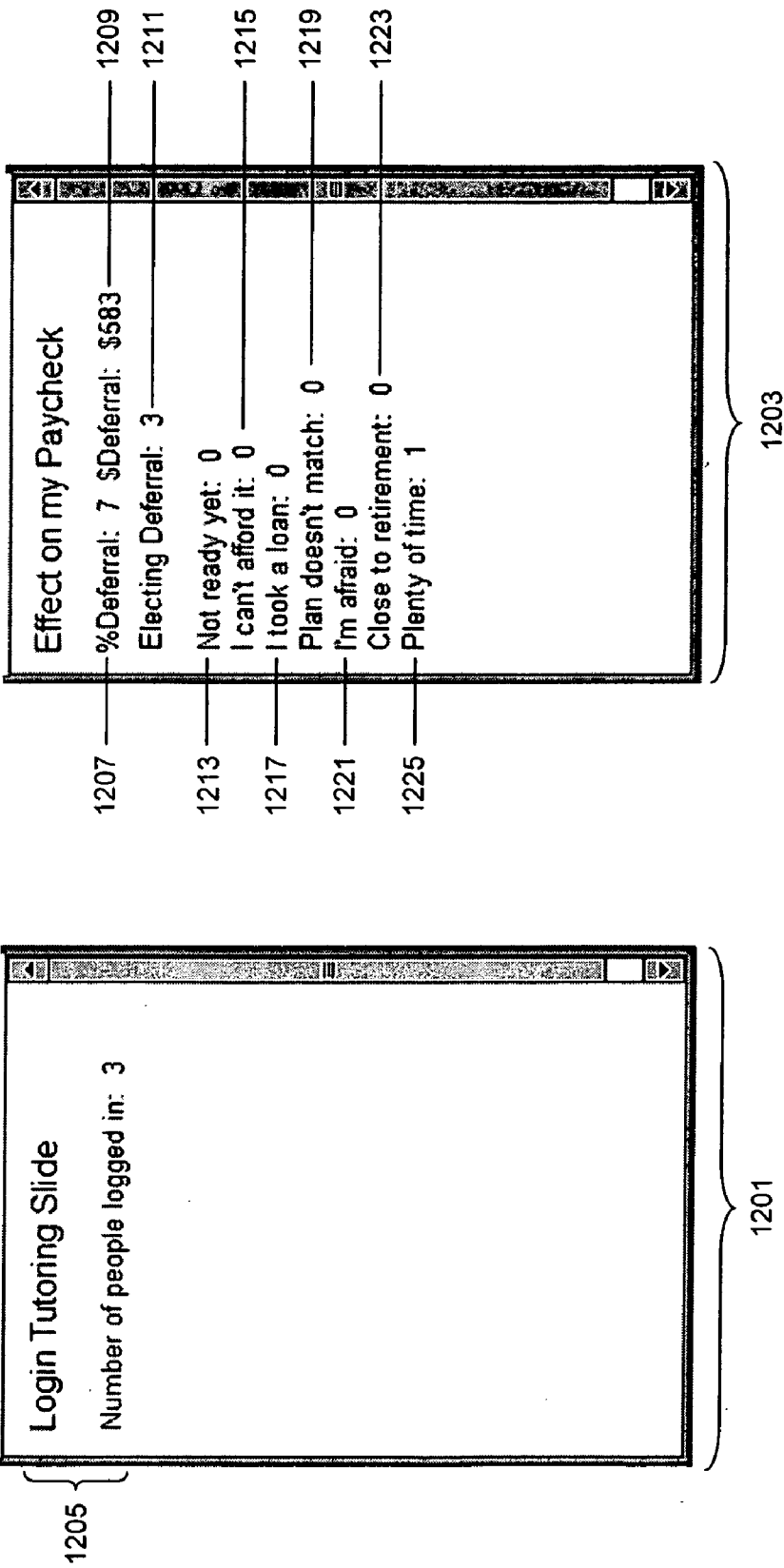


Fig. 12

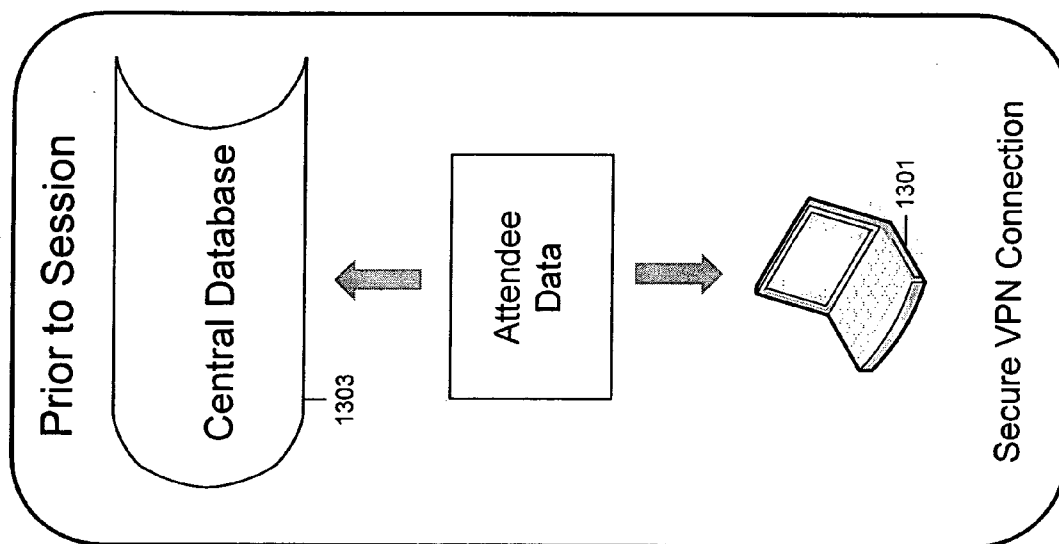


Fig. 13

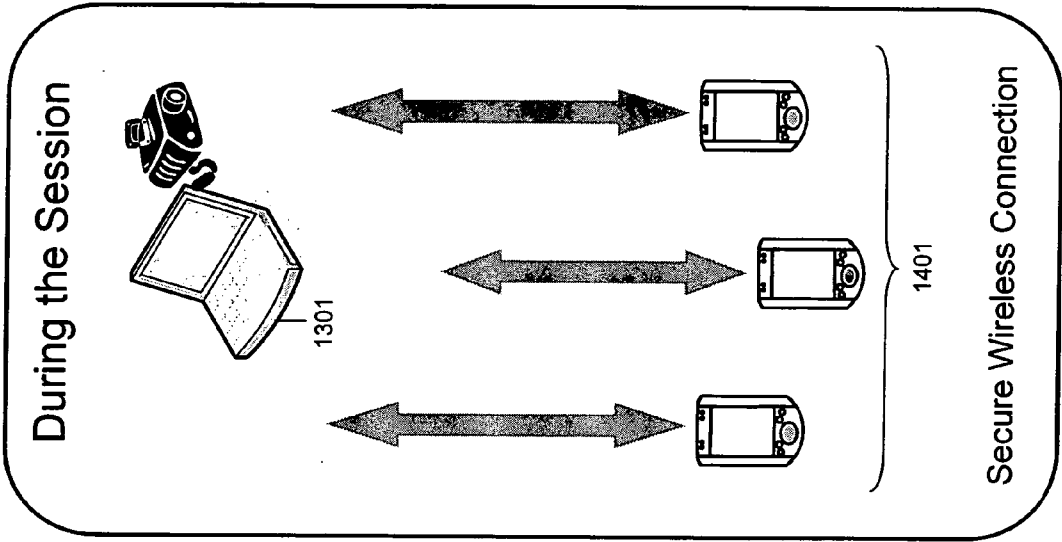


Fig. 14

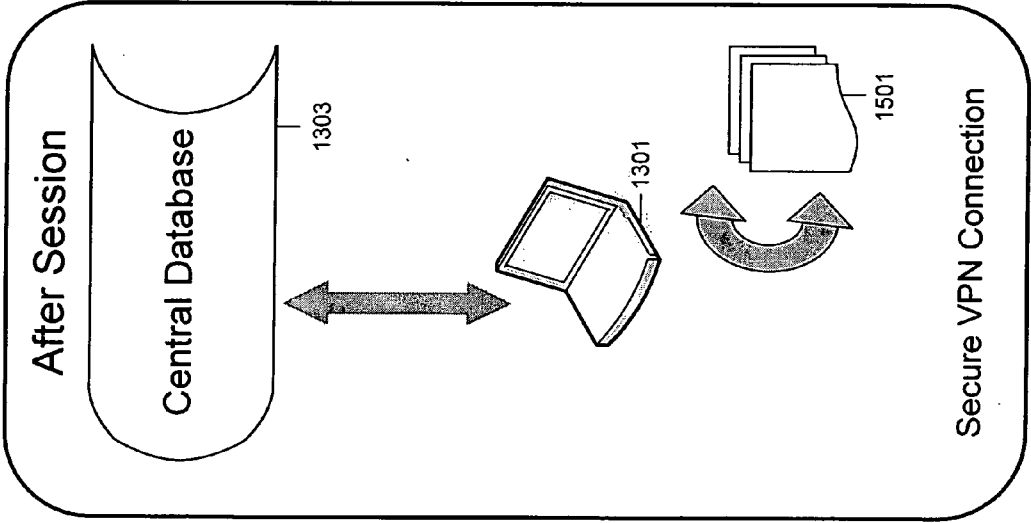


Fig. 15

INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM

[0001] The present application is a continuation-in-part of application Ser. No. 11/190,633, filed Jul. 26, 2005, which is a continuation-in-part of application Ser. No. 11/112,990, filed Apr. 22, 2005, which is a continuation of application Ser. No. 10/016,517, filed Nov. 1, 2001 (now U.S. Pat. No. 6,982,733), which is a continuation-in-part of application Ser. No. 09/400,413, filed Sep. 21, 1999 (now U.S. Pat. No. 6,384,850). The contents of application Ser. No. 11/190,633, application Ser. No. 11/112,990, application Ser. No. 10/016,517, and application Ser. No. 09/400,413 are incorporated herein by reference.

FIELD OF THE INVENTION

[0002] This invention relates to an information management and synchronous communications system and method for generation of computerized menus for restaurants, sessions (e.g., enrollment sessions), and other applications with specialized display and synchronous communications requirements related to, for example, the use of equipment or software with non-PC-standard graphical formats, display sizes and/or applications for use in remote data entry, information management and synchronous communication between host computer, digital input device or remote pager via standard hardwired connection, the internet, a wireless link, smart phone or the like.

BACKGROUND OF THE INVENTION

[0003] While computers have dramatically altered many aspects of modern life, pen and paper have prevailed in the hospitality industry, e.g., for restaurant ordering, reservations and wait-list management, because of their simplicity, ease of training and operational speed. For example, ordering prepared foods has historically been done verbally, either directly to a waiter or over the telephone, whereupon the placed order is recorded on paper by the recipient or instantly filled.

[0004] Although not previously adapted for wide-scale use in the hospitality industry, various forms of digital wireless communication devices are in common use, e.g., digital wireless messengers and pagers. Also in common use are portable laptop and handheld devices. However, user-friendly information management and communication capability not requiring extensive computer expertise has not heretofore been available for use in everyday life such as for restaurant ordering, reservations and wait-list management. Hundreds of millions of dollars have been spent on personal digital assistant ("PDA") development seeking to produce a small, light-weight and inexpensive device that could be adapted to such uses; yet none have yielded a satisfactory solution.

[0005] One of the inherent shortcomings of PDA type devices is that, as they strive for small size, low weight and low cost, they must compromise the size and clarity of the operator display medium interface itself, which in most cases is one of a variety of LCD (liquid crystal display) type devices. As the size of the display shrinks, the amount of information that may be displayed at any one point or time is commensurately decreased, typically requiring multiple screens and displays to display information to the operator. This reduces the overall utility of the device. Additionally,

the smaller display and keyboard results in a non-optimal operator interface, which slows down operation and is thus unacceptable for the time criticality of ordering, reservation and wait-list management and other similar applications. This necessitates many design compromises which in the aggregate have resulted in limited acceptance of PDA type devices in the restaurant and hospitality fields.

[0006] Many of the negatives prevalent in earlier devices have been eliminated, but, to date, there is still no integrated solution to the ordering/waitlist/reservation problem discussed above. With the advent of the Palm® and other handheld wireless devices, however, the efforts to make such devices ubiquitous have begun to bear fruit at least in some areas, e.g., personal calendars. However, substantial use of such devices in the restaurant and hospitality context has not occurred to date. As discussed above, at least one of the reasons PDAs have not been quickly assimilated into the restaurant and hospitality industries is that their small display sizes are not readily amenable to display of menus as they are commonly printed on paper or displayed on, e.g., large, color desktop computer screens. Another reason is that software for fully realizing the potential for wireless handheld computing devices has not previously been available. Such features would include fast and automatic synchronization between a central database and multiple handheld devices, synchronization and communication between a World Wide Web ("Web") server and multiple handheld devices, a well-defined application program interface ("API") that enables third parties such as point of sale ("POS") companies, affinity program companies and internet content providers to fully integrate with computerized hospitality applications, real-time communication over the internet with direct connections or regular modem dialup connections and support for batch processing that can be done periodically throughout the day to keep multiple sites in synch with the central database. A single point of entry for all hospitality applications to communicate with one another wirelessly has also previously been unavailable. Such a single point of entry would work to keep all wireless handheld devices and linked Web sites in synch with the backoffice server (central database) so that the different components are in equilibrium at any given time and an overall consistency is achieved. For example, a reservation made online would be automatically communicated to the backoffice server and then synchronized with all the wireless handheld devices wirelessly. Similarly, changes made on any of the wireless handheld devices would be reflected instantaneously on the backoffice server, Web pages and the other handheld devices.

[0007] For the foregoing reasons, paper-based ordering, waitlist and reservations management have persisted in the face of widespread computerization in practically all areas of commerce. At most, computerization of these functions has been largely limited to fixed computer solutions, i.e., desktop or mainframe, because of the problems heretofore faced in configuring wireless handheld devices and maintaining database synchronization for such applications. Specifically, the unavailability of any simple technique for creating restaurant menus and the like for use in a limited display area wireless handheld device or that is compatible with ordering over the internet has prevented widespread adoption of computerization in the hospitality industry. Without a viable solution for this problem, organizations

have not made the efforts or investments to establish automated interfaces to handheld and Web site menus and ordering options.

[0008] A principal object of the present invention is to provide an improved information management and synchronous communications system and method which facilitates user-friendly and efficient generation of computerized menus for restaurants and other applications that utilize equipment with non-PC-standard graphical formats, display sizes and/or applications.

[0009] A further object of the present invention is to provide an improved information management and synchronous communications system and method which provides for entry, management and communication of information from the operator as well as to and from another computer, Web page menu, remote digital device using a standard hardwired connection, the internet or a wireless link.

[0010] A further object of the present invention is to provide an improved information management and synchronous communications system which is small, affordable and lightweight yet incorporates a user-friendly operator interface and displays menus in a readily comprehensible format.

[0011] A further object of the present invention is to provide a synchronous information management and communications system which enables automatic updating of both wireless and internet menu systems when a new menu item is added, modified or deleted from any element of the system.

SUMMARY OF THE INVENTION

[0012] The foregoing and other objects of the present invention are provided by a synchronous information management and communications system and method optimized for simplicity of operation which incorporates menu generation for creation of menus to be used with wireless remote handheld computer and PDA devices, the internet or any application where simple and efficient generation of menus is appropriate. The menu generation approach of the present invention includes a desktop software application that enables the rapid creation and building of a menu and provides a means to instantly download the menu configuration onto, e.g., a handheld device or Web page and to seamlessly interface with standard point of sale ("POS") systems to enable automatic database updates and communication exchanges when a change or input occurs in any of the other system elements. To solve the above and other related problems, an information management and communications system is provided which results in a dramatic reduction in the amount of time, and hence cost, to generate and maintain computerized menus for, e.g., restaurants, sessions (e.g., enrollment sessions), and other related applications that utilize non-PC-standard graphical formats, display sizes or applications. The menu generation approach of the present invention has many advantages over previous approaches in solving the problem of converting paper-based menus or Windows® PC-based menu screens to small PDA-sized displays and Web pages. In one embodiment, the present invention is a software tool for building a menu, optimizing the process of how the menu can be downloaded to either a handheld device or Web page, and making manual or automatic modifications to the menu after initial creation.

[0013] Manual modifications to the generated menus include handwritten screen captures and/or voice recorded message captures coupled with the standard menus and modifiers generated according to standard choices. Such manual modifications enable an extremely rapid and intuitive interface to enhance operations and further optimize the overall operator interface. This approach solves a long-standing, operational issue in restaurant/hotel/casino food/drink ordering when customers want something unusual and not anticipated and available through normal computerized selections. As seen in **FIG. 8**, the operator screen on the hand-held can capture handwritten information specific to a customers requests directly on the touch-sensitive screen of the wireless computing device. This additional information can then be coupled with the fixed menu and modifier information generated automatically from the hospitality application software and the combined message can be sent to a restaurant point of sale (POS) system, printer or/or display system. This unique operator interface enables universal languages and an unlimited set of information to be manually communicated and exchanged. The resultant combined message of one or more fixed indications selected from a menu of a device such as a hand-held, and dynamic handwritten messages and/or data provides an even more powerful tool than either modality used independently.

[0014] For example a restaurant server taking a drink order could select from a menu of her hand-held device's screen "Iced Tea", and then manually write in the literal screen of her hand-held "with lemon" as shown in **FIG. 8**. The manually-written information could, for example, be printed or displayed in front of a bartender preparing the drink order. The indication "Iced Tea" as selected from a menu of the hand-held would also be presented to the bartender, perhaps by printing and/or screen display. The server can also select any printer from within the hospitality establishment directly from the operator interface on the screen of the hand-held and have either the order or the receipt printed out where it is most convenient and efficient.

[0015] Similarly, a server taking a drink order could select from a menu of her hand-held device's screen "Iced Tea", and then record the voice message "with lemon" using her hand-held device integral microphone. The recorded information could, for example, be played on a speaker attached to a computer, POS system, or the like located near the bartender or chef preparing the order. The indication "Iced Tea" as selected from a menu of the hand-held would also be presented to the bartender/chef, perhaps by printing and/or screen display. Both the literal screen capture method and the voice recorded message method combine the power of automatic fixed menu generation with the expanded flexibility to resolve operational issues that exist throughout the hospitality market without this innovative solution. Additionally, in certain embodiments, hand-writing and voice recognition technologies can be utilized to convert the manual operator inputs into appropriate text messages which can be combined with the computer generated menu options to convey the combined information to, for example, a bartender or chef. It is further noted that, in various embodiments, language conversion functionality may be provided. For instance, inputs (e.g., operator inputs) in one or more languages might be converted into one or more other languages (e.g., into one or more text messages of the one or more other languages). Such operator inputs might, for instance, be manual operator inputs (e.g., written and/or

voice inputs). Automated language translation technologies, handwriting recognition technologies, and/or voice recognition technologies might, in various embodiments, be employed.

[0016] As an illustrative example, a server taking a drink order might select from a menu of her hand-held device's screen "Iced Tea", and then provide English-language manual operator input. For example, the server might manually write, in English, in the literal screen of her hand-held "with lemon". As another example the server might record, using the hand-held, the English-language voice message "with lemon". The English-language manual operator input might then be converted into appropriate Spanish-language and/or Japanese-language text messages. Such Spanish-language and/or Japanese-language text messages might, for instance, be combined with computer generated menu options, and/or might be conveyed to a bartender or chef. In various embodiments, messages (e.g., reply messages) from the bartender or chef might be returned to the server. For instance, Spanish-language and/or Japanese-language manual input (e.g., handwriting and/or voice input of the sort discussed above) provided via a device of the bartender or chef might be converted into appropriate English-language text messages and conveyed to the server. It is noted that, in various embodiments, the "Communications Conversions" depicted in FIG. 10 might include language conversion.

[0017] Similarly, hand-held devices can link the above innovations to individual customers at specific tables through a graphical user interface on the hand-held screen that assigns each customer a number within a table. For example, table 20 might have 6 customers (1-6) and each customer has a different order. By enabling the linkage of the orders to specific customer positions within the table and accessible from the hand-held screen, the servers can easily track and link the specific orders to the specific customers.

[0018] The use of wireless handheld devices in the restaurant and hospitality industry is becoming increasingly pervasive as restaurant owners and managers become more aware of the benefits. With the proper wireless handheld system in place, restaurants can experience increased table turns from improved server productivity and shorter order taking and check paying times. Restaurants and POS companies seeking to provide a wireless handheld interface to their desktop-based POS systems or a Web page equivalent face several challenges. These challenges include building a menu using their existing database and transferring the menu onto handheld devices or Web pages that will interface with servers wirelessly or to restaurants/customers over the internet. The menu generation approach of the present invention is the first coherent solution available to accomplish these objectives easily and allows one development effort to produce both the handheld and Web page formats, link them with the existing POS systems, and thus provides a way to turn a complicated, time-consuming task into a simple process.

[0019] The information management and synchronous communications system of the present invention features include fast synchronization between a central database and multiple handheld devices, synchronization and communication between a Web server and multiple handheld devices, a well-defined API that enables third parties such as POS companies, affinity program companies and internet content

providers to fully integrate with computerized hospitality applications, real-time communication over the internet with direct connections or regular modem dialup connections and support for batch processing that can be done periodically throughout the day to keep multiple sites in synch with the central database.

[0020] The communication module also provides a single point of entry for all hospitality applications, e.g., reservations, frequent customer ticketing, wait lists, etc. to communicate with one another wirelessly and over the Web. This communication module is a layer that sits on top of any communication protocol and acts as an interface between hospitality applications and the communication protocol and can be easily updated to work with a new communication protocol without modifying the core hospitality applications. An exemplary system diagram of such a communications systemic relationship is shown in FIG. 9 and serves as an example of the power of the synchronization element of the invention through a common, linked solution. A single point of entry works to keep all wireless handheld devices and linked web sites in synch with the backoffice server applications so that the different components are in equilibrium at any given time and an overall consistency is achieved. For example, a reservation made online can be automatically communicated to the backoffice server and then synchronized with all the wireless handheld devices wirelessly. Similarly, changes made on any of the wireless handheld devices are reflected instantaneously on the backoffice server Web pages and the other handheld devices.

[0021] In various embodiments, functionality applicable, for instance, to sessions (e.g., informational and/or enrollment sessions) might be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The foregoing features and advantages of the present invention can be appreciated more fully from the following description, with references to the accompanying drawings in which:

[0023] FIG. 1 is a schematic representation of a window displayed on a computer display screen which shows a hierarchical tree menu, modifier window and sub-modifier window in conformity with a preferred embodiment of the present invention.

[0024] FIG. 2 is a schematic representation of a modifier dialog box in conformity with a preferred embodiment of the present invention.

[0025] FIG. 3 is a schematic representation of a menu category dialog box in conformity with a preferred embodiment of the present invention.

[0026] FIG. 4 is a schematic representation of a menu item dialog box in conformity with a preferred embodiment of the present invention.

[0027] FIG. 5 is a schematic representation of a display customization dialog box in conformity with a preferred embodiment of the present invention.

[0028] FIG. 6 is a schematic representation of a communications control window in conformity with a preferred embodiment of the present invention.

[0029] FIG. 7 is a schematic representation of a point of sale interface on a wireless handheld device for use in

displaying page menus created in conformity with a preferred embodiment of the present invention.

[0030] **FIG. 8** is an example of a literal, hand-written screen according to embodiments of the present invention.

[0031] **FIG. 9** is an exemplary system diagram relating to embodiments of the present invention.

[0032] **FIG. 10** is a further exemplary system diagram relating to embodiments of the present invention.

[0033] **FIG. 11** shows exemplary screens according to embodiments of the present invention.

[0034] **FIG. 12** shows further exemplary screens according to embodiments of the present invention.

[0035] **FIG. 13** depicts exemplary synchronization according to embodiments of the present invention.

[0036] **FIG. 14** depicts further exemplary synchronization according to embodiments of the present invention.

[0037] **FIG. 15** depicts still further exemplary synchronization according to embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0038] Most personal computers today run under an operating system that provides a graphical user interface ("GUI") for accessing user applications. A GUI is used in the preferred embodiment of the present invention. Through an interface of windows, pull-down menus, and toolbars, GUI operating systems have simplified PCs and have rendered computer technology more user friendly by eliminating the need to memorize keyboard entry sequences. In addition, GUIs allow users to manipulate their data as they would physical entities. For example, a window can represent a file and the contents of the window can represent the records of the file. The window can be opened, closed, or set aside on a desktop as if it were an actual object. The records of the file can be created, deleted, modified and arranged in a drag-and-drop fashion as if they also were physical objects. The most common GUI operating systems that provide this "object-oriented" environment for personal computers are Microsoft Windows® systems, including Windows CE® for handheld wireless devices and the like. Generally, a particular application program presents information to a user through a window of a GUI by drawing images, graphics or text within the window region. The user, in turn, communicates with the application by "pointing" at graphical objects in the window with a pointer that is controlled by a hand-operated pointing device, such as a mouse, or by pressing keys on a keyboard.

[0039] The use of menus is conventional in GUIs for software applications. Menus are typically utilized to provide end users of applications with available choices or processing options while using the applications. For example, in a typical desktop or interactive application, selection of a "file" from a menu bar may cause display of a context menu which provides "file" options. File options can have additional subordinate or child options associated with them. If a file option having subordinate options is selected, the child options are displayed in context in a child menu or submenu proximate to the selected parent option. One or more of the child options provided in the child menu

may have further subordinate options. Thus, such a menu system comprises cascading sets of menus which are displayable in context to show the parent/child relationships between options of the context menu. A menu system of this type is incorporated into the preferred embodiment of the invention.

[0040] The preferred embodiment of the present invention uses typical hardware elements in the form of a computer workstation, operating system and application software elements which configure the hardware elements for operation in accordance with the present invention. A typical workstation platform includes hardware such as a central processing unit ("CPU"), e.g., a Pentium® microprocessor, RAM, ROM, hard drive storage in which are stored various system and application programs and data used within the workstation, modem, display screen, keyboard, mouse and optional removable storage devices such as floppy drive or a CD ROM drive. The workstation hardware is configured by software including an operating system, e.g., Windows® 95, 98, NT or CE, networking software (including internet browsing software) and application software components. The preferred embodiment also encompasses a typical file server platform including hardware such as a CPU, e.g., Pentium® microprocessor, RAM, ROM, hard drive, modem, and optional removable storage devices, e.g., floppy or CD ROM drive. The server hardware is configured by software including an operating system, e.g., Windows® 95, 98, NT or CE, networking software (including Web server software) and database software.

[0041] A computer workstation for use in the preferred embodiment also includes a GUI. As is conventional, the GUI is configured to present a graphical display on the display screen arranged to resemble a single desktop. Execution of an application program involves one or more user interface objects represented by windows and icons. Typically, there may be several windows and icons simultaneously present on the desktop and displaying information that is generated by different applications.

[0042] The window environment is generally part of the operating system software that includes a collection of utility programs for controlling the operation of the computer system. The computer system, in turn, interacts with application programs to provide higher level functionality, including a direct interface with the user. Specifically, the application programs make use of operating system functions by issuing task commands to the operating system which then performs the requested task. For example, an application program may request that the operating system display certain information on a window for presentation to the user.

[0043] An aspect of the preferred embodiment of the information management and communications system of the invention is shown in **FIG. 1**. **FIG. 1** shows an example of the GUI provided by the operating system of the preferred embodiment of the present invention. With reference to **FIG. 1**, the preferred embodiment includes an intuitive GUI 1 from which to build a menu on a desktop or other computer. A hierarchical tree structure 2 is used to show the different relationships between the menu categories 3 (e.g., soups, salads, appetizers, entrees, deserts, etc.), menu items 4 (e.g., green salad, chicken caesar salad, etc.), menu modi-

fiers **5** (e.g., dressing, meat temperature, condiments, etc.) and menu sub-modifiers **6** (e.g., Italian, French, ranch, bleu cheese, etc.).

[0044] The procedure followed in configuring a menu on the desktop PC and then downloading the menu configuration onto the POS interface on the handheld device in conformance with the preferred embodiment is as follows.

[0045] The menu configuration application is launched by clicking on the appropriate icon on the desktop display screen. **FIG. 1** will then be displayed. There are three windows on the screen shown in **FIG. 1**. The left window is the menu tree **7**, also called the tree view. The top right window is the Modifiers window **8** and the bottom right window is the Sub-Modifiers window **9**. The Sub-Modifiers window lists the sub-modifiers that correspond to the modifier that is selected. The views on the right are referred to as list views. There are several ways of invoking a command, including using the menu options; using the context menu (right mouse click); using the keyboard or using the toolbar icons. For example, if it is desired to add a category to the menu, the following four options are available: (1) clicking on Edit, Add Category; (2) right mouse clicking on Menu, then clicking on Add Category; (3) highlighting Menu, then typing Ctrl+T or (4) clicking on the Add Category icon on the toolbar. To add an item to a category, the following options are available: (1) highlighting the category to which it is desired to add an item and then clicking on Edit>Add Item; (2) right mouse clicking on the desired category and then clicking on Add Item; (3) highlighting the desired category, then typing Ctrl+N or (4) clicking on the Add icon on the toolbar.

[0046] When building a menu, it should be kept in mind that the menu items are stored using a tree metaphor similar to how files are stored on a PC with folders and subfolders. The menu structure is similar to the Windows® File Explorer in the way the items are organized hierarchically. Below is an example of how an item may be configured:

```

Menu
>>  Entrees
      >>  Red Meat
            >>  NY Strip
                  >>  Vegetables
                        >>  Tomato
                        >>  Lettuce
                        Meat Temperature
                        >>  Medium Rare

```

In the above example, Menu is the root. Entrees is a menu category. Red Meat is an Entree category. NY Strip is a modifier. Vegetable is a modifier. Meat Temperature is a modifier. Medium Rare is a sub-modifier of Meat Temperature.

[0047] The steps taken in building a menu are as follows:

[0048] 1. Add Modifiers;

[0049] 2. Add Sub-Modifiers and link them to the Modifiers;

[0050] 3. Create Menu categories;

[0051] 4. Add menu items to the categories;

[0052] 5. Assign Modifiers to the menu items;

[0053] 6. Preview the menu on the POS emulator on the desktop PC;

[0054] 7. Download the menu database to the handheld device.

[0055] To add modifiers, a user clicks on the inside of the Modifiers window, then (1) clicks on Edit>Add Modifier; (2) Presses Ctrl+N; (3) right mouse clicks in the Modifiers window, then clicks on Add Modifiers or (4) clicks on the Add icon from the toolbar. If a menu is being built from scratch, the procedure is to enter the Long Name, Short Name, Code and Price in the Modifier dialog box **10** shown in **FIG. 2**. The Long Name is the full descriptive name of the item. The Short Name is the abbreviated name that will be displayed on the handheld device. The Code is the numeric or alphanumeric code for the item. If there is an existing database, the existing database can be browsed and menu items retrieved from the database. Clicking on the Browse button will bring up the existing database of menu items. The item to be added is then selected and "OK" is clicked. The fields will then be filled with the information from the database. Clicking on OK again will add the item as a modifier. To delete a modifier, the modifier is selected and the Delete key pressed on the keyboard. To edit a modifier, either the modifier is double clicked or the Enter key is pressed.

[0056] Sub-modifiers represent the last level of modifiers that can be assigned to a menu tree. To add sub-modifiers, the modifier to which sub-modifiers are to be assigned is selected. Then, the focus is set on the sub-modifier window by clicking inside the Sub-Modifier window as follows: (1) clicking on Edit>Add Sub-Modifier; (2) pressing Ctrl+N; (3) right mouse clicking in the Sub-Modifiers window, then clicking on Add Sub-Modifiers or (4) clicking on the Add icon from the toolbar. If a menu is being built from scratch, the procedure is to enter the Long Name, Short Name, Code and Price in a Sub-Modifier dialog box similar to the Modifier dialog box shown in **FIG. 2**. As with modifiers, the Long Name is the full descriptive name of the item. The Short Name is the abbreviated name that will be displayed on the handheld device. The Code is the numeric or alphanumeric code for the item. As before, if there is an existing database, the existing database can be browsed and menu items retrieved from the database. Clicking on the Browse button will bring up the existing database of menu items. The item to be added is then selected and OK clicked. The fields will then be filled with the information from the database. Clicking on OK again will add the item as a sub-modifier. To delete a sub-modifier, the sub-modifier is selected and the Delete key depressed on the keyboard. To edit a sub-modifier, either the sub-modifier is double clicked or the Enter key is pressed.

[0057] Menu categories are created from the root. Some examples of categories are Appetizers, Soups, Salads, Entrees, Desserts, etc. The first step is to click on Menu in the menu tree window. Categories are added by (1) clicking on the Add Category icon from the toolbar; (2) clicking on Edit>Add Category or (3) pressing Ctrl+T. As shown in **FIG. 3**, Menu Category dialog box **11** then appears in which to enter the Long and Short names for the menu category.

[0058] To add menu items to categories, the menu category which is being built is clicked. For example, if items

are being added to Appetizers, the Appetizers branch is clicked on. Then the Edit>Add Item is clicked on or Ctrl+N pressed. As before, if a menu is being built from scratch, the procedure is to enter the Long Name, Short Name, Code, Prep Time, Recipe and Price into the Menu Item dialog box **12** shown in **FIG. 4**. The Long Name is the full descriptive name of the item. The Short Name is the abbreviated name that will be displayed on the handheld device. The Code is the numeric or alphanumeric code for the item. Prep Time is the time it takes to prepare the meal and Recipe would include preparation methods and ingredients that are used in the preparation of the item. If there is an existing database, the existing database can be browsed and menu items retrieved from the database. Clicking on the Browse button will bring up the existing database of menu items. The item to be added is then selected and OK is clicked. The fields will then be filled with the information from the database. Clicking on OK again will add the item to the category.

[0059] Once the menu items have been entered, it may be desired to assign some modifiers to the menu items. For example, it may be desired to assign meat temperature to a steak order. To accomplish this, first the modifier to be assigned is selected, then the menu item on the tree view that is to be assigned the modifier is clicked on and then Edit>Assign Modifier is clicked on. Or, the modifier can simply be dragged and dropped onto the menu item to link them. A dialog box is then displayed asking if this modifier is a required modifier. If it is a required modifier, the display icon will be red but if it is a non-required modifier the display icon will be green. As many modifiers as are applicable can be assigned. If any changes are made to the modifiers, those changes will be automatically reflected throughout the menu tree.

[0060] Once the modifiers have been entered, it may be desired to assign sub-modifiers to the modifiers items. For example, it may be desired to add Honey Mustard as a sub-modifier to Dressing. To accomplish this, first the modifier to be assigned a sub-modifier is selected, then the sub-modifier window is clicked on, then Edit>Add Sub Modifier is clicked on, Ctrl+N entered or the Add icon from the toolbar is clicked on. Or, the sub-modifier can simply be dragged and dropped onto the modifier to link them.

[0061] When the menu has been completely configured, it can be previewed on a POS emulator on the desktop to verify that the menu is correctly configured before downloading it to the handheld device. To preview, File>Preview Database is clicked on or the Preview Database icon from the toolbar is clicked on. The handheld POS emulator on the desktop can then be run. If the configuration is deemed acceptable, the handheld device is connected to the desktop PC to ensure that a connection has been established; the POS application on the handheld device is exited and File>Download Database is clicked on or the Download Database icon from the toolbar is clicked on. If there is an existing menu database on the handheld device, the system will ask if the existing database should be replaced. Yes is clicked if existing database replacement is desired.

[0062] A database function enables the creation of, e.g., a breakfast menu, lunch menu and dinner menu and downloading them to a handheld device. Functions available are (1) creating a new database; (2) opening an existing database; (3) saving a database under a different name. To access these functions, File is clicked on the menu bar.

[0063] The preferred embodiment encompasses customized layout, views and fonts. To set the focus on the view it is desired to change, click inside the desired window. The main customizing dialog box is accessed by clicking on View>Customize View. A dialog box **13**, as shown in **FIG. 5**, will be displayed including tabs that allow the following options: selection of Columns to display in the list view by choosing and arranging the fields to display in the Modifiers and Sub-Modifiers windows; formatting Columns by specifying the column widths and justification; selecting Filter allows restricting the list to display only the items that meet certain criteria. For example, display of modifiers with codes between 500 and 550. Selecting Sort allows sorting the modifiers or sub-modifiers according to any of the available fields such as Name, Code or Price. Selecting Style facilitates choice of font type, style, size, etc. To change the font in a particular window, click on View>Fonts or right mouse click in the desired window and then click on Fonts. To change the size of the windows, drag the borders of the windows to expand or contract the size of the windows. To change the column widths, simply drag the edge of the column headers to increase or decrease the column widths.

[0064] A communications control program monitors and routes all communications to the appropriate devices. It continuously monitors the wireless network access point and all other devices connected to the network such as pagers, remote devices, internet Web links and POS software. Any message received is decoded by the software, and then routed to the appropriate device. No user action is needed during operation of the software once the application has been launched. To launch the communications control module, a Wireless Traffic icon is clicked on the desktop PC. When the program loads, the screen shown in **FIG. 6** appears. Messages received are logged in the window **14** shown in **FIG. 6** with a time stamp. The messages are also logged to a file on the hard drive. This provides a mechanism to monitor all traffic across the network (possibly useful for troubleshooting, or maintenance, but not necessary for normal operation). The program may be minimized so the screen is not displayed on the desktop, but it must be running for proper communications to exist between all devices on the network.

[0065] As stated, the preferred embodiment of the present invention includes the use of and compatibility with GUI technology. A drag-and-drop approach is used for organizing the tree structure **2** in the generated menu. Drag-and-drop is also used for assigning modifiers (modifiers can be dragged from the modifiers window **5** and dropped onto the menu item **4** for assignment). In-cell editing results in fast editing of items in building the menus. Customizable fonts enable users to change font types, style and size. Customizable layouts enable users to resize windows, change icons and display preferences. The inventive approach provides for fully persistent storage between sessions, even if a session is improperly or abruptly terminated. Font and the tree state (i.e., which nodes are expanded/collapsed) are stored between sessions. Layout for modifiers and sub-modifiers list views (filter, columns, formatting, font, etc.) are stored between sessions. The last database used is likewise stored between sessions. Splitter views allow the user to see different views at the same time. Each view is displayed on its own section of the screen. Views can be resized via the keyboard or a mouse by simply dragging the splitter in the middle.

[0066] An automated function is provided to import existing POS databases into the inventive menu generation system and, as discussed above with respect to the detailed example of how to use the preferred embodiment, an automated download procedure is provided to transfer the desktop database onto a handheld device and/or Web page. Also as discussed, the preferred embodiment facilitates preview of the handheld device or Web page version of the POS menu on the desktop before downloading and configuration. Customizable desktop menu generation is contemplated, as discussed above, in the form of customizable fonts, columns, layouts, etc. The inventive approach also includes templates for common modifiers that can be assigned to similar menu items. The preferred embodiment also supports multiple databases, thus providing for the creation and storing of different menu databases on handheld devices such as breakfast, lunch or dinner menus. The user can then select the appropriate database to reflect the time of day.

[0067] FIG. 7 is a schematic representation of a point of sale interface 15 for use in displaying a page-type menu 16 created using the inventive menu generation approach. As can be seen from FIG. 7, the page menu is displayed in a catalogue-like point-and-click format whereas the master menu, FIG. 1, is displayed as a hierarchical tree structure. Thus, a person with little expertise can “page through” to complete a transaction with the POS interface and avoid having to review the entire menu of FIG. 1 to place an order. A PDA or Web page format could appear like FIG. 7 or the display could be configured for particular requirements since fully customizable menu generation and display are contemplated.

[0068] The POS interface on the handheld device supports pricing in the database or querying prices from the POS server. The POS device also can be customized with respect to “look and feel” for the particular version. As can be seen in FIG. 7, the POS interface provides for billing, status and payment with respect to orders. A myriad of options can be provided depending on the application.

[0069] Advanced database functions are provided in the preferred embodiment of the invention, including an automated download process onto handheld devices and/or Web sites. In the preferred embodiment, the menu generation system of the present invention uses an API called ActiveX Data Objects (“ADO”) for database access. ADO is useful in a variety of settings. It is built on top of OLE DB and can be used to talk to databases and, in the future, any data source with any OLE DB driver. Advanced querying is supported. The database can be queried on virtually all fields. Queries can be built using SQL syntax for experienced users or can be created using a query builder which guides users through the creating process. Advanced error handling is supported. Errors occurring at run time can be trapped. A descriptive message is displayed to alert the user and provide error information. However, the application does not terminate when the errors happen. The source code is easy to maintain and modify, thus allowing for on time delivery of customized versions of the software. The advanced database functions produce well-designed databases that accommodate growth and scalability.

[0070] The inventive menu generation approach provides a solution for the pervasive connectivity and computerization needs of the restaurant and related markets. The inven-

tive solution includes automatic database management and synchronization, PDA and handheld wireless operating system integration and optimization, wireless communications and internet connectivity, user interface design, and graphics design.

[0071] In the preferred embodiment, the menu generation approach of the present invention uses Windows CE® as the operating system for the handheld devices. Windows CE® provides the benefits of a familiar Windows 95/98/NT® look and feel, built-in synchronization between handheld devices, internet and desktop infrastructure, compatibility with Microsoft Exchange®, Microsoft Office 9® and TCP/IP quick access to information with instant-on feature.

[0072] Windows CE® provides a basic set of database and communication tools for developer use. However, interfacing with these tools to provide application specific results can be a complex task. In addition to the menu generation described above, a set of software libraries described herein in conformance with the present invention not only enhances the basic Windows CE® functionality by adding new features but also maximizes the full potential of wireless handheld computing devices. Such features include fast synchronization between a central database and multiple handheld devices, synchronization and communication between a Web server and multiple handheld devices, a well-defined API that enables third parties such as POS companies, affinity program companies and internet content providers to fully integrate with computerized hospitality applications, real-time communication over the internet with direct connections or regular modem dialup connections and support for batch processing that can be done periodically throughout the day to keep multiple sites in synch with the central database.

[0073] The synchronous communications control module discussed above provides a single point of entry for all hospitality applications to communicate with one another wirelessly or over the Web. This communications module is a layer that sits on top of any communication protocol and acts as an interface between hospitality applications and the communication protocol. This layer can be easily updated to work with a new communication protocol without having to modify the core hospitality applications. The single point of entry works to keep all wireless handheld devices and linked Web sites in synch with the backoffice server (central database) so that the different components are in equilibrium at any given time and an overall consistency is achieved. For example, a reservation made online is automatically communicated to the backoffice server which then synchronizes with all the wireless handheld devices wirelessly. Similarly, changes made on any of the wireless handheld devices will be reflected instantaneously on the backoffice server and the other handheld devices. In various embodiments, the reservation might be converted into one or more messages (e.g., text messages and/or instant messages), and/or text-to-voice functionality might be employed to allow direct interaction via any telephone.

[0074] The software applications for performing the functions falling within the described invention can be written in any commonly used computer language. The discrete programming steps are commonly known and thus programming details are not necessary to a full description of the invention.

[0075] A simple point-to-point wireless capability is contemplated which permits simple digital messages to be sent from the wireless handheld devices to a receiver in a beeper and/or valet parking base-station. The POS interface of FIG. 7 is representative of the display on a typical wireless device used in conformity with the invention. A simple protocol is used to acknowledge receipt of the message and thus simultaneous communication is not necessary, which reduces the cost of the wireless link. The range of the wireless link is determined by the characteristics of the radio transceiver. Adding a wireless link allows paging of beeper equipped customers directly from the operator interface on the wireless handheld devices and communication to and from various input/output transmitters and receivers to update the status of the order, reservation or other information and thus further reduce the workload on the operator and enable operations to proceed much faster. This link could also be hardwired or otherwise implemented using any two-way messaging transport. According to various embodiments of the present invention, messaging (e.g., wireless text messaging and/or wireless instant messaging) and/or text-to-voice functionality may be employed, for instance, in appointment, waitlist, and/or reservation operations. Such functionality might, in various embodiments, involve messaging (e.g., wireless messaging), text-to-voice, and/or two-way interactivity, and/or may involve communication via landline telephones, cellular telephones, and/or wireless devices.

[0076] Such functionality may be implemented in a number of ways. So as to illustrate by way of example, employing such functionality in the making of appointments and/or reservations will be discussed. It is noted that, in various embodiments, reservations functionality might include the use of waitlists. It is further noted that, in various embodiments, waitlist requests (e.g., in restaurants and/or casinos) might be viewed as short-term and/or on-the-spot reservation requests.

[0077] A user (e.g., a customer or staff member) desiring to make an online appointment and/or reservation for an entity (e.g., a restaurant, a plumber or other repair service, a hair salon, a healthcare establishment (e.g., a doctor's office, dentist's office, or hospital), or a pet groomer) might, for example, employ a web page (e.g., of a web portal) to specify the desired entity. As another example, the user might employ a web page (e.g., of a web portal) as a means of remote access.

[0078] The user might, for example, choose the entity from entities listed by the web page. Such listed entities might, for instance, be ones matching criteria specified by the user. Such criteria might, for example, include location, type, and/or price range. Having specified the entity for which he wished to make an appointment and/or reservation, the user might be able to specify relevant information such as, for instance, name under which the appointment and/or reservation should be made, number of people, desired appointment and/or reservation date, and/or desired appointment and/or reservation time. In various embodiments, the user might be able to specify alternatives for various of such information (e.g., specifications of second and/or third choices for desired appointment and/or reservation time). Specifications might, for instance, be via one or more links and/or other GUI elements provided by the web page.

[0079] It is noted that, in various embodiments, the user might be able to specify multiple desired entities. For example, the user might be able to specify that he desires to make an appointment and/or reservation with each of multiple specified entities. As another example, the user might be able to specify that he desires that an appointment and/or reservation be made with only one of multiple specified entities. For instance, in various embodiments the user might be able to rank specified entities, and an appointment and/or reservation could be made on behalf of the user with the highest ranking entity for which an appointment and/or reservation could be successfully made.

[0080] To illustrate by way of example, the user might specify three restaurants, ranked "1", "2", and "3", with "1" being the most desirable. In the case where appointment and/or reservation with restaurant "1" was not possible, but appointment and/or reservation with each of restaurants "2" and "3" was possible, appointment and/or reservation could be made on behalf of the user with restaurant "2".

[0081] With the user having provided such information, one or more operations could be performed to communicate with the entity in a manner employing automated messaging (e.g., automated wireless messaging). Such automated messaging might, for example, involve an automated telephone call wherein some or all of the information provided by the user is automatically converted to spoken words (e.g., via text-to-voice) and conveyed to the entity. As another example, such automated messaging might involve automated text messaging (e.g., automated wireless text messaging) and/or automated instant messaging (e.g., automated wireless instant messaging) wherein some or all of the information provided by the user is automatically converted to text and/or data and conveyed to the appropriate entity.

[0082] For example, a computer (e.g., a server) might act to contact the entity in an automated manner. The computer might, for example, determine the phone number of the entity (e.g., via database lookup) and place an automated telephone call to the entity. As another example, the computer might, alternately or additionally, determine a messaging address and/or telephone number of the entity (e.g., via database lookup) and send a message (e.g., of the sort discussed above) in an automated manner to the entity. In placing such a telephone call and/or sending such a message the computer might, for example, use integrated and/or peripheral telephone access hardware and/or voice synthesis hardware. It is noted that, in various embodiments, the computer might act to provide the webpage to the user. Alternately or additionally, in various embodiments the webpage might be provided by other than the computer. In various embodiments, as this process continues, synchronization (e.g., database synchronization throughout the system network) may be maintained (e.g., as shown in FIG. 10). It is noted that, in various embodiments, such synchronization may occur at all times.

[0083] With the message and/or call being answered at the entity, the computer might perform one or more operations. For example, the computer might convey (e.g., subsequent to automatic conversion of information provided by the user) the desired appointment and/or reservation to the entity. The computer might, in various embodiments, further convey the source of the entity (e.g., the name of a web page and/or company employed by the user in making the

appointment and/or reservation). To illustrate by way of example, the computer might speak:

[0084] “Hello, this is your automated reservations assistant. I have a new reservation for you. The reservation is for Mr. Smith, party of 6, for May 1st”.

[0085] In various embodiments, similar information might be conveyed by the computer via messaging (e.g., via automated wireless messaging).

[0086] Having conveyed the desired appointment and/or reservation, the computer might, for instance, seek one or more responses from the entity. The computer might, for example, seek responses entered via touch tone keypad via the call. Such entered response might, for instance, be automatically converted via touch tone recognition technology. As another example, the computer might seek spoken responses via the call. Such spoken responses might, for instance, be automatically converted via voice recognition technology (e.g., of the sort discussed above). As another example, such spoken responses might be automatically converted, captured, and/or stored, and be presented to the user (e.g., via the web page, telephone call, and/or messaging). In seeking responses, the computer might perform one or more operations.

[0087] For example, the computer might speak to indicate that “1” should be spoken and/or pressed by an individual affiliated with the entity who answers the phone in the case where the appointment and/or reservation is acceptable, that “2” should be spoken and/or pressed in the case where the appointment and/or reservation is denied, that “3” should be spoken and/or pressed in the case where it is desired that the user seeking the appointment and/or reservation call the entity to make other arrangements, and that “4” should be spoken and/or pressed to relay a voice message instruction to the user. The computer might, in various embodiments, seek similar information via messaging (e.g., automated wireless messaging). Such a relayed voice message might, for instance, be presented to the user in a manner analogous to that discussed above (e.g., via web page, telephone call, and/or messaging). The relayed voice message might, in various embodiments, be automatically converted for such presentation to the user. With the individual affiliated with the entity specifying one of the choices, the computer might, for example, make note of the selection, and/or process and/or store the selection for integration with one or more operations discussed herein (e.g., synchronization). Synchronization might, in various embodiments, be performed as shown in FIG. 10.

[0088] It is noted that, in various embodiments, in the case where the computer was not able to successfully reach the entity and/or receive a valid response from the entity, the computer might keep trying and/or try alternate contact modes. Alternately or additionally the computer might in various embodiments, if appropriate, attempt to contact one or more other entities. As noted above, in various embodiments of the present invention the user might be able to specify that he desires that an appointment and/or reservation be made with only one of multiple specified entities (e.g., with the user ranking the specified entities). The computer might, in various embodiments, attempt to reach (e.g., in a manner discussed above) each of such multiple specified entities seeking appointment and/or reservation. For example, the computer might attempt to reach each of

such multiple specified entities in one or more orders corresponding to user ranking (e.g., attempting to reach the highest-ranking entity first). The computer might, in various embodiments, stop attempting to reach such multiple specified entities in the case where an appointment and/or reservation was successfully made. It is noted that such functionality could, in various embodiments, occur without human action on the part of the user and/or a provider of the web page.

[0089] The computer might, in various embodiments, act to pursue multiple entities in parallel. In so pursuing entities in parallel the computer might, for example, present to the user results and/or progress of its work (e.g., as appointment and/or reservation availability results), and/or allow the user to select from presented possibilities a desired choice. The multiple entities so pursued might, in various embodiments, be automatically chosen by the computer. For example, the computer might choose the multiple entities in accordance with matches to search criteria (e.g., real-time search criteria). As another example, the computer might, alternately or additionally, choose the multiple entities in accordance with previously established (e.g., stored) user unique lists (e.g., a list of the user’s 15 favorite restaurants).

[0090] To illustrate by way of example, the user might learn of restaurants for which appointment and/or reservation could be secured (e.g., for a particular date and time), and select from those a desired restaurant. Such communication with the user might, for example, be implemented in a manner analogous to that discussed above.

[0091] It is additionally noted that, in various embodiments, multiple modes of contact might be available to the computer for communicating with the entity. For example, the computer might be able to employ one or more telephone calls, web pages, emails, pages, facsimiles, instant messages, and/or text messages conveying (e.g., subsequent to automatic conversion of information provided by the user) the desired appointment and/or reservation, and/or seeking responses from the entity. As another example, the computer might be able to receive and/or interpret (e.g., with automatic conversion of information provided by the entity) one or more telephone calls, web pages, emails, pages, facsimiles, instant messages, and/or text messages conveying the entity’s responses. In various embodiments, in the case where one mode of contact was not successful, another mode might then be tried.

[0092] In various embodiments, the entity might be able to offer one or more alternate appointments and/or reservations (e.g., in the case where a desired appointment and/or reservation could not be provided). Such functionality might be implemented in a number of ways. The entity might, in various embodiments, be able to specify that such a suggested alternate appointment and/or reservation would be held until a particular date and/or time, and/or that such a suggested alternate appointment and/or reservation would not be held, and that the user was advised to provide a decision regarding the acceptability of the suggested alternate appointment and/or reservation by a specified time and/or date. Accordingly, in various embodiments, in the case where the user did not indicate such a suggested alternate appointment and/or reservation to be acceptable by the termination of the hold, the corresponding inventory (e.g., availability inventory) might be freed up for use by

others. The provision of one or more alternate appointment and/or reservation times, dates, and/or other information by an entity might, for example, be via touch tone keypad, voice, preset availability, and/or messaging. In various embodiments, one or more databases and/or computers might come to know of the results of communicating with the entity, one or more statistics might be stored, updated, and/or generated, and/or one or more reports might be stored, updated, and/or generated (e.g., as shown in **FIG. 10**). Accordingly, for instance, one or more records of appointments and/or reservations and/or availabilities for the entity might be updated. Some or all of such results, statistics, and/or reports might, in various embodiments, be accessible (e.g., via web page and/or via text-to-voice) by, for instance, entities and/or system administrators. In various embodiments, a password and/or identifier (e.g., an access code) might need to be provided. Additionally, in various embodiments, management alerts to various criteria (e.g., preset criteria) might be generated. Such alerts (e.g., late appointments and/or a patient being late for a required action in a hospital) might, for example, be automatically communicated to the appropriate management staff of the appropriate entity when corresponding criteria were met. Communication of such alerts might, for instance, be performed in a manner analogous to that discussed above (e.g., via automated telephone call employing text-to-voice, automated text messaging, and/or automated instant messaging).

[0093] The user seeking the appointment and/or reservation could, in various embodiments, come to know of the results of communicating with the entity (e.g., subsequent to automatic conversion of information provided by the entity). For example, the user might be informed by way of web page, email, page, telephone call (e.g., employing text-to-voice), facsimile, instant message, and/or text message. In various embodiments, a password and/or identifier (e.g., an access code) might need to be provided. In embodiments where one or more alternate appointments and/or reservations were suggested by the entity, the user might be able to indicate the acceptability of those alternate appointments and/or reservations. The entity could then, in various embodiments, be made aware of the user's response. Such functionality for communicating with the user and/or entity might, for instance, be implemented in a manner analogous to that discussed above (e.g., automatic conversion might be employed).

[0094] A computer operating to communicate with the entity as discussed herein might, for example, be dedicated to performing such operations. As another example, such a computer might be one performing other tasks (e.g., acting as a web server). It is noted that, in various embodiments, one or more rules may be followed in communicating with the entity and/or the user. For example, a rule might specify that the entity and/or the user is not to be telephoned and/or be sent messages before and/or after certain hours of the day. As another example, a rule might specify that one mode of contact (e.g., telephone call) is to be employed as a means of contact for certain hours of the day, while a second mode of contact (e.g., instant messaging) is to be employed as a means of contact for other hours of the day.

[0095] It is noted that, according to various embodiments of the present invention, an entity might be able to update inventory (e.g., available tables and/or seats). Accordingly, for instance, the entity might be able to indicate an increase

and/or decrease in inventory. In various embodiments, a password and/or identifier (e.g., an access code) might need to be provided.

[0096] Such functionality might be implemented in a number of ways. For example, telephone call, web page, email, facsimile, instant message, and/or text message might be employed. To illustrate by way of example, an individual affiliated with the entity might call a telephone number and be greeted with text-to-voice speech prompting for code and password to be entered via touch tone keypad and/or be spoken. The text-to-voice speech might then prompt the user to employ touch tone keypad and/or voice in increasing or decreasing inventory (e.g., availability inventory), and/or employ touch tone keypad and/or voice in specifying one or more new inventory values. Such functionality might, in various embodiments, be implemented by a computer such as one, for instance, operating in a manner analogous to that discussed above.

[0097] It is noted that, in various embodiments, an entity might be able to indicate that one or more portions of inventory (e.g., availability inventory) be set aside for one or more particular purposes. For example, an entity might be able to specify that a portion of inventory be set aside for walk-ins, and/or that a portion of inventory be set aside for conventional telephone appointments and/or reservations.

[0098] It is additionally noted that, in various embodiments, a computer interacting with a user desiring to make an online appointment and/or reservation (e.g., as discussed above) might take into account such inventory information in interacting with the user. For example, the user might be prevented from specifying a desired appointment and/or reservation date and/or time known by the computer to correspond to inventory that was not available.

[0099] In various embodiments, synchronization might be performed. Such synchronization might, for instance, be of the sort discussed herein (e.g., as shown in **FIG. 10**).

[0100] For example, synchronization might occur between one or more computers that operate to communicate with the entity, one or more computers that operate to communicate with the user, one or more web servers, one or more web sites, one or more cellphones (e.g., smartphones) and/or PDAs, and/or one or more backoffice servers (central databases). To illustrate by way of example, appointments and/or reservations data, and/or inventory data might be synchronized. It is noted that such computers, servers, and/or web sites may, for example, employ software programmed to employ one or more of the operations discussed above.

[0101] It is noted that via various of the operations discussed above, the need for personal computers and/or terminals (e.g., network-connected computers and/or terminals) at entity locations (e.g., restaurants) may be eliminated. For example, in various embodiments a telephone (e.g., a landline or cellular telephone) may be the only equipment needed by an entity (e.g., a restaurant or salon).

[0102] It is further noted that, in various embodiments, various of the operations discussed above may be implemented in a manner that enhances existing systems (e.g., web-based systems) such as, for instance, existing systems for reservation, appointment, orders, and/or waitlisting.

[0103] The functionality discussed above may be employed in a number of ways. For example, in various

embodiments the functionality discussed above might be employed in ways including reservations, appointments, and/or waitlisting for entities such as, for example, restaurants, hotels, casinos, hair salons, pet groomers, and/or repair services (e.g., plumbers).

[0104] Shown in FIG. 10 is an exemplary system diagram relating to embodiments of the present invention wherein, for example, various of the functionality discussed above (e.g., messaging, text-to-voice, and communications with landline telephones, cellular telephones, and wireless devices) is depicted.

[0105] According to various embodiments of the present invention, individuals attending a session (e.g., an informational and/or enrollment session) might be provided with devices. Such devices might, for instance, be wireless, portable, and/or handheld. The individuals might, for example, be provided with PDAs, cell phones (e.g., smartphones), and/or laptops. Such a session might, for example, relate to finance, employee programs (e.g., benefits), investment, one or more plans (e.g., health and/or retirement plans), one or more business opportunities, one or more employment opportunities, insurance (e.g., health, life, car, and/or home insurance), education (e.g., the session might be an academic and/or a vocational class, and/or the session might relate to one or more educational opportunities), and/or hospitality. It is further noted that, in various embodiments, such a session might be an enrollment session.

[0106] Various functionality (e.g., interactive and/or informational functionality) might, in various embodiments, be provided by such devices given to individuals attending a session. For example, such devices might allow for (e.g., via one or more GUIs and/or other interfaces) “what-if” analysis, identification of goals (e.g., financial, investment, and/or retirement goals), access to custom plan portfolios, investor profiling, access to options (e.g., medical options and/or insurance options), informational media (e.g., text, graphics, sound, and/or video), questions, answers, quizzes, games (e.g., recreational and/or informational games), and/or communications. Such functionality might, for instance, be provided by the devices during a time that a session leader is making a presentation and/or answering questions in conjunction with the session.

[0107] According to various embodiments of the present invention, functionality for paperless enrollment may be provided. Such functionality may be implemented in a number of ways. For example, devices provided to session attendees might (e.g., via one or more GUIs and/or other interfaces) allow for attendees to indicate desire to enroll and/or not enroll, and/or to provide various corresponding details (e.g., elections and/or allocations). To illustrate by way of example, in the case where individuals were attending a session regarding retirement plans, the individuals might, in various embodiments, be able to employ provided devices in indicating desire to enroll in one or more of the retirement plans, and/or to provide various enrollment details (e.g., amount of pre-tax salary contribution).

[0108] Shown in FIG. 11 are exemplary screens corresponding to various functionality of the sort discussed above (e.g., of a device provided to an individual attending a session). Exemplary screen 1101 provides “Last Name” field 1107, “First Name” field 1109, “4 digit PIN” field 1111, “Submit” button 1113, and “Reset” button 1115. Exemplary screen 1101 might, for instance, be employed in login.

[0109] Exemplary screen 1103 provides “Birth Date” field 1117, “Marital Status” radio buttons 1119, “Desired Retirement Age” pull-down 1121, “Years in Retirement” pull-down 1123, “Annual Salary” field 1125, “Estimated Annual Increase” pull-down 1127, “Payroll Frequency” pull-down 1129, “Back” button 1131, and “Next” button 1133. Exemplary screen 1103 might, for example, be employed as an “About You” screen.

[0110] Exemplary screen 1105 provides “Pre-Tax Contribution” deferral field 1135, “After-Tax Contribution” deferral field 1137, “Large Cap Growth Fund” investment field 1139, “Small/Mid Cap Growth Fund” investment field 1141, “International/Global Fund” investment field 1143, “Small/Mid Cap Value Fund” investment field 1145, “Large Cap Value Fund” investment field 1147, and “I agree to the above contributions” checkbox 1149. Exemplary screen 1105 might, for example, be employed in as a “Confirmations” screen

[0111] Session monitoring functionality might, in various embodiments, be available. Such monitoring functionality might, for instance, be made available to session leaders, and/or might be provided (e.g., via one or more GUIs and/or other interfaces) via one or more session leader devices. Such session leader devices might, for instance, be of the sort discussed above. To illustrate by way of example, such monitoring functionality might be available to the leader of a session via a PDA, cell phone (e.g., smartphone), and/or laptop of the leader of a session.

[0112] A number of features might be provided via such monitoring. For example, activity of individuals attending the monitored session might be tracked. Such tracking might, for instance, involve consideration of activities performed by session attendees via devices provided to them (e.g., activities performed in conjunction with functionality of the sort discussed above provided by such devices).

[0113] Such monitoring might be employed in a number of ways. For example, a session leader might employ such monitoring to prevent attendees from falling behind and/or getting ahead (e.g., of other attendees and/or of a session presentation). As another example, a session leader might adjust session presentation in view of information and/or insights obtained via monitoring (e.g., to adjust presentation in real-time to make presentation more relevant to the particular individuals attending, and/or to encourage enrollment). For instance, information obtained via monitoring such as dollar amounts invested, number of enrollments achieved, reasons for choosing not to enroll, and/or session evaluation feedback might be considered by session leaders in session presentation adjustment.

[0114] Shown in FIG. 12 are exemplary monitoring screens (e.g., of a device of a session leader). Exemplary screen 1201 provides, for example, via text 1205 information regarding a particular slide being shown in conjunction with a presentation. In the example of screen 1201, text 1205 indicates that for slide “Login Tutoring Slide” the “Number of people logged in” is “3”.

[0115] Exemplary screen 1203 provides, for example, text 1207 indicating the average deferral percentage among session attendees, text 1209 indicating the average dollar amount deferral among session attendees, text 1211 indicating the number of session attendees electing deferral, and

text **1213-1225** indicating the number of session attendees specifying particular reasons for not electing deferral. More specifically, text **1213** indicates the number of session attendees specifying “Not ready yet” as a reason for not electing deferral, text **1215** indicates the number of session attendees specifying “I can’t afford it” as a reason for not electing deferral, text **1217** indicates the number of session attendees specifying “I took a loan” as a reason for not electing deferral, text **1219** indicates the number of session attendees specifying “Plan doesn’t match” as a reason for not electing deferral, text **1221** indicates the number of session attendees specifying “I’m afraid” as a reason for not electing deferral, text **1223** indicates the number of session attendees specifying “Close to retirement” as a reason for not electing deferral, and text **1225** indicates the number of session attendees specifying “Plenty of time” as a reason for not electing deferral.

[**0116**] It is noted that, in various embodiments, session leaders might be able to employ their devices to communicate with session attendees via their devices. Such communication might, for instance, be to answer questions raised during the session and/or to provide individualized help. Such communication might, for example, be via voice (e.g., employing Voice Over Internet Protocol (VOIP)), via text messaging, and/or via instant messaging. It is further noted that, in various embodiments, session leaders might be able (e.g., remotely via their devices) to alter operation of devices provided to session attendees. For example, session leaders might be able to alter device operation so as to assist attendees in operations that they are performing using provided devices (e.g., a session leader might assist an attendee in performing an “what-if” analysis using a provided device). As another example, session leaders might be able to alter device operation so as to assist attendees in technical issues that they might experience in using the devices.

[**0117**] According to various embodiments, session report generation (e.g., summary report generation) functionality might be provided. For instance, such report generation might be made available to session leaders, and/or might be provided (e.g., via one or more GUIs and/or other interfaces) via one or more devices (e.g., of the sort discussed above). A single click might, in various embodiments, be sufficient to request report generation. Such reports might, for example, be created by a session leader device and/or by one or more other devices (e.g., one or more servers).

[**0118**] A variety of information might be included in generated reports. For example, generated reports might include information regarding attendee participation (e.g., in one or more provided sessions), enrollment (e.g., regarding enrollment and/or failure to enroll by attendees, and/or enrollment options selected by attendees), and/or usage statistics. Generated reports might be employed in a number of ways. For instance, generated reports might be employed to gain understanding of what presentation techniques were most successful in encouraging enrollment.

[**0119**] Relationship management functionality might, in various embodiments, be available. Such functionality might, for instance, include capturing contact information (e.g., email addresses, mailing addresses, and/or telephone numbers) from session attendees. Contact information might, for example, be captured for all session attendees. As another example, in the case where a session offered enroll-

ment, contact information might be captured from only session attendees that chose to enroll and/or from only session attendees that chose not to enroll.

[**0120**] Contact information might be captured in a number of ways. For instance, session attendees might supply such information via devices provided to them for the session. For example, such a provided device might (e.g., via a GUI and/or other interface) request that its user supply (e.g., via a GUI and/or other interface) such information. It is noted that, in various embodiments, provision of contact information by session attendees might be in response to a request for such. Such a request might, for instance, be provided by a session leader (e.g., via a GUI and/or other interface of a device employed by that session leader). Responsive to such a request, devices provided to session attendees might act so that their users provide the contact information. Devices provided to session attendees might learn of such a request in a number of ways. For example, indication that such a request has been made might be dispatched (e.g., via wireless or wired link) from a session leader device to devices provided to session attendees.

[**0121**] Captured Contact information might be employed in a number of ways. For example, captured contact information might be employed in ongoing and/or after-session marketing directed towards attendees (e.g., attendees that chose to enroll and/or attendees that chose not to enroll).

[**0122**] Synchronization might, in various embodiments, be performed. Such synchronization might, for instance, be performed in a manner analogous to that discussed above. Such synchronization might, for example, occur between devices provided to session attendees, session leader devices, one or more plan administrator devices, one or more web servers, one or more web sites, and/or one or more backoffice servers (central databases). Such devices, servers, and/or web sites might, for example, employ software programmed to perform one or more of the operations discussed herein with respect to sessions, and/or may possess in an accessible store (e.g., local and/or remote storage) data regarding one or more of the operations discussed herein with respect to sessions. Such software might, for instance, be held by such devices, servers, and/or web sites in an accessible store (e.g., local and/or remote storage). It is noted that, in various embodiments, such synchronization might involve synchronization of data and/or software corresponding to sessions.

[**0123**] In various embodiments, synchronization might make use of secure (e.g., encrypted) connection. For example, secure Virtual Private Network (VPN) connection and/or secure wireless connection might be employed. It is additionally noted that, in various embodiments, synchronization might make use of authentication. Such authentication might, for instance, occur at the user and/or network level. Moreover, in various embodiments, communication among software modules might be secure and/or authenticated. It is further noted that, in various embodiments, synchronization might involve synchronization with storage (e.g., hard disk storage, compact disk, and/or Digital Versatile Disc (DVD)). Such hard disk storage might, for instance be a Redundant Array of Independent Disks (RAID).

[**0124**] A variety of synchronizations might occur. For example, devices provided to session attendees might, in

various embodiments, make use of synchronized data (e.g., in performing one or more of the operations discussed above). Such data might, for instance, be synchronized between devices provided to session attendees, session leader devices, and/or one or more servers. To illustrate by way of example, data employed by devices provided to session attendees for “what-if” analysis and/or identification of goals might be synchronized between the devices employed to session attendees and session leader devices.

[0125] As another example, enrollment functionality might, in various embodiments, make use of synchronized data (e.g., so as to provide plan elections for processing). Such data might, for instance, be synchronized between devices provided to session attendees, session leader devices, plan administrator devices, and/or one or more servers. For instance, the elections and/or allocations of an attendee choosing to enroll might be synchronized such that the elections and/or allocations come to exist at a plan administrator’s device. Subsequently, for example, processing of the enrollment might occur (e.g., by one or more operations of the plan administrator, the plan administrator’s device, and/or one or more servers and/or other devices). Such functionality might, for instance, help to reduce time and paper use in plan enrollment.

[0126] As yet another example, session monitoring functionality might, in various embodiments, make use of synchronized data. Such data might, for instance, be synchronized between devices provided to session attendees, session leader devices, and/or one or more servers. As a further example, report generation might, in various embodiments, make use of synchronized data. Such data (e.g., generated reports) might, for instance, be synchronized between devices provided to session attendees, session leader devices, plan administrator devices, and/or one or more servers. To illustrate by way of example, generated reports might be synchronized between session leader devices, plan administrator devices, and/or one or more backoffice servers (central databases). It is noted that, in various embodiments, analysis of synchronized data (e.g., generated reports) might be performed by plan administrators.

[0127] As an additional example, relationship management functionality might, in various embodiments, make use of synchronized data. Such data (e.g., contact information) might, for instance, be synchronized between devices provided to session attendees, session leader devices, and/or one or more servers. It is noted that, in various embodiments, synchronization may allow for automatic updating of, for instance, wireless, fixed, and/or Internet-based systems.

[0128] FIG. 13 depicts exemplary synchronization between session leader device 1301 and central database 1303 wherein attendee data is synchronized. Such synchronization might, for instance, occur prior to a session and/or might involve secure VPN connection.

[0129] FIG. 14 depicts exemplary synchronization between session leader device 1301 and attendee devices 1401. Such synchronization might, for instance, include synchronization of data employed by attendee devices 1401 for “what-if” analysis and/or identification of goals, data relating to enrollment functionality, data relating to session monitoring functionality, and/or data relating to relationship management functionality. Such synchronization might, for

instance, occur during a session, and/or might involve secure wireless connection. It is noted that, in various embodiments, leader devices may be connected to projector units.

[0130] FIG. 15 depicts exemplary synchronization between session leader device 1301, central database 1303, and storage 1501. Such synchronization might, for instance, include synchronization of data relating to enrollment functionality, data relating to session monitoring functionality, and/or data relating to relationship management functionality. Such synchronization might, for instance, occur after a session, and/or might involve secure VPN connection.

[0131] It is noted that various of the functionality discussed herein with respect to sessions might, for example, serve to increase enrollment rates. Such increased enrollment rates might, for instance, be at-session enrollment rates and/or enrollment rates relating to a particular post-session time period (e.g., rates for enrollment within 60 days of a session). It is further noted that various of the functionality discussed herein with respect to sessions might, for example, help sessions to be interactive and personalized for attendees, help attendees to make informed and/or educated enrollment decisions (e.g., while in session), help attendees to increase their understanding of options (e.g., plan options), help guide attendees through enrollment processes, enable real-time enrollment, and/or allow for receipt of feedback (e.g., allow session leaders and/or sales force to receive feedback).

[0132] In various embodiments, menu generation may be performed with respect to various of the functionality discussed herein with respect to sessions. Such menu generation functionality might, for instance, be implemented in a manner analogous to that discussed above. Menu generation might, for example, be performed with respect to functionality offered by devices provided to session attendees, enrollment functionality, session monitoring functionality, report generation functionality, and/or relationship management functionality. To illustrate by way of example, menu generation with respect to enrollment functionality might involve a menu category “Investments”, “Large Cap Growth Funds” as an “Investments” category, one or more particular large cap growth funds as modifiers, and/or investment percentage as a sub-modifier for one or more of the particular large cap growth funds.

[0133] It is noted that, in various embodiments, functionality allowing for modification (e.g., handwritten and/or voice modification) of such generated menus might be provided. Such modification functionality might, for instance, be implemented a manner analogous to that discussed above. For example, an attendee employing a provided device to enroll in a retirement program and to elect a particular retirement plan might select that plan from a menu offered by the device, and then manually write on the screen of the device a clarification and/or question (e.g., “I plan to retire at 60”). As another example, the attendee might alternately or additionally employ the device to make a voice recording offering a clarification and/or question (e.g., “I plan to retire at 60”). In various embodiments, language conversion functionality might be provided. Such language conversion functionality might, for instance, be implemented a manner analogous to that discussed above.

[0134] It is additionally noted that, in various embodiments, one or more APIs and/or communication control

modules might be employed with respect to session functionality. Such APIs and/or communication control modules might, for example, be implemented in a manner analogous to that discussed above. Such a communication control module might, for instance, provide a single point of entry for all applications regarding sessions.

[0135] It is further noted that, in various embodiments, websites might be employed in the implementation of various functionality discussed herein. For instance, various functionality discussed herein with respect to session leader devices and/or devices provided to attendees might involve those devices connecting to websites. As another example, various functionality discussed herein with respect to session leader devices and/or devices provided to attendees might involve devices other than session leader devices and/or devices provided to attendees connecting to websites offering such functionality.

[0136] A further aspect of the invention is the use of the menus generated in accordance with the described technique to place orders from wireless remote handheld devices or from remote locations through the internet. The World Wide Web is a distributed hypermedia computer system that uses the internet to facilitate global hypermedia communication using specified protocols. One such protocol is the Hypertext Transfer Protocol ("HTTP"), which facilitates communication of hypertext. Hypertext is the combination of information and links to other information. In the context of the Web, hypertext is defined by the Hypertext Mark-up Language ("HTML"). The links or hyperlinks in a HTML document reference the locations of resources on the Web, such as other HTML documents. Another language used in creating documents for use on the Worldwide Web, to display on computer screens, or to create speech style sheets for use in, e.g., telephones, is the Extensible Mark-Up Language ("XML"). XML is a "metalanguage", i.e., a language for describing languages which was developed to eliminate the restrictions of HTML.

[0137] The Web is a client-server system. The HTML documents are stored on Web server computers, typically in a hierarchical fashion with the root document being referred to as the home page. The client specifies a HTML document or other source on the server by transmitting a Uniform Resource Locator ("URL") which specifies the protocol to use, e.g., HTTP, the path to the server directory in which the resource is located, and filename of the resource. Users retrieve the documents via client computers. The software running on the user's client computer that enables the user to view HTML documents on the computer's video monitor and enter selections using the computer's keyboard and mouse is known as a browser. The browser typically includes a window in which the user may type a URL. A user may cause a URL to be transmitted by typing it in the designated window on the browser or by maneuvering the cursor to a position on the displayed document that corresponds to a hyperlink to a resource and actuating the mouse button. The latter method is commonly referred to simply as "clicking on the hot-spot" or "clicking on the hyperlink". The hyperlink methodology is contemplated for use in accordance with the preferred embodiment to transmit orders via the internet.

[0138] Web server application software exists that enables a user to shop for and order merchandise. Such systems are

sometimes referred to as electronic merchandising systems or virtual storefronts. Systems that enable a user to choose among several retailers' goods are sometimes referred to as electronic malls. An electronic retailer's or electronic mall operator's Web server provides HTML forms that include images and descriptions of merchandise. The user may conventionally search for an item by entering a key word search query in a box on a form. When a user selects an item, the server may provide a linked form that describes that item in further detail. The user may also conventionally enter ordering information into boxes on the form, such as the type and quantity of the item desired. The information entered by the user is transmitted to the server. The user may select multiple items in this manner and then enter a credit card number to pay for the purchases. The retailer processes the transaction and ships the order to the customer. As can be appreciated, ordering merchandise can also be done from menus. The generation of menus of items or merchandise for sale over the internet is readily accomplished by the menu generation approach of the present invention.

[0139] Searching for items that the user is interested in purchasing is insufficient in prior merchandising systems. Database management programs use index searching to facilitate rapid searching of large amounts of data. The creator of the database may instruct the program to use specified fields in the database as indexed or key fields. The program locates all terms in the database that appear in the indexed fields and stores them in an index table. Each entry in the index table includes a term and corresponding pointer to the location in the database where the term is found. If a user initiates a search for a term that is present in the index table, the program can locate the instances of that term in the database with exceptional speed. Users who are familiar with the particular database they are searching will generally know which fields are indexed and will know the format of the data in those fields. For example, a user of a database containing the inventory of a bookstore may know that users can search for the names of authors of books and that a user who wishes to do so should enter the author's last name first. A user having such knowledge will therefore be able to search efficiently. Users of electronic merchandising systems, however, are generally end-consumers who have no knowledge of a merchant's database. If, as is very likely, such a user initiates a search for a term that is not present in the index table, the program must sequentially search through all records in the database. Sequential records are typically linked by pointers. Using pointers in this manner is very demanding on server resources, resulting not only in an exceptionally slow search, but also creating a bottleneck for other processes that the server may be executing. The menu generation approach of the present invention can be used to create customized menus from a database that includes every item of merchandise the vendor has for sale. In this manner, customers can scan the generated menu much more readily than they could view the entire database and the necessity of having familiarity with the database is eliminated as well, reducing the need for resource intensive pointers.

[0140] While the preferred embodiment of the invention is for the generation of restaurant menus and the like, the broad scope of the invention is far greater. For example, menus generated in accordance with the invention can be used in the desktop computing environment in association with the operating system or application programs. One such use is

to facilitate the creation of user personalized file structures for general desktop use. Another use is to facilitate the location of customized menus from master menus for use in association with application software to make the execution of the application software more efficient by, e.g., eliminating the necessity of querying or checking every tree branch in the master menu file structure in response to user input or other criteria and to create handheld/PDA compatible versions of the software.

[0141] While the preferred embodiment of the invention includes the selection of items from a master menu wherein the master menu is displayed using a graphical user interface, it is to be appreciated that any means for displaying the master menu to the user and generating another menu in response to and comprised of the selections made is encompassed by the contemplated invention. The invention encompasses the selection of nontextual symbols, characters, icons and the like, in addition to text, from a hierarchical tree menu or the like for generation of another menu comprised of such items.

[0142] It is also within the scope of the invention to generate menus automatically in response to predetermined criteria. For example, in the restaurant menu generation embodiment, a modified menu can be generated to comply with a particular specification or group of criteria such as, e.g., "dinner", "low cholesterol", "low fat", "fish", "chicken", or "vegetarian". In this embodiment, only items from the master menu that satisfy specified parameters will be included in the generated menu. The selection process could involve selection of master menu items based on tags or identifiers associated with the items or by checking every master menu item against a dictionary of items acceptable for inclusion in the modified menu. It should also be appreciated that the invention encompasses any combination of automatic and manual user selection of the items comprising the generated menu. For example, a user might specify criteria which would further control automatic selection or the user could manually select some items with automatic selection of others. The menu generation aspect of the invention is equally applicable to table-based, drive-thru, internet, telephone, wireless or other modes of customer order entry, as is the synchronous communications aspect of the invention.

[0143] The inventive concept encompasses the generation of a menu in any context known to those skilled in the art where an objective is to facilitate display of the menu so as to enable selection of items from that menu. The restaurant menu generation embodiment is but one example of a use for the inventive concept. Likewise, displaying menus generated in accordance with the invention on PDAs and Web pages to facilitate remote ordering are but a few examples of ways in which such a menu might be used in practice. Any display and transmission means known to those skilled in the art is equally usable with respect to menus generated in accordance with the claimed invention.

[0144] In the more general situation, menus can be generated in accordance with the present invention in a variety of situations. For example, the usable file structure for a particular data processing application can be dictated by the user or an application program prior to or during the execution of the application program. Efficiencies with respect to computational speed and equipment, e.g., storage

and processor, usage can thus be achieved along with the facilitation of display of the generated menu.

[0145] While the best mode for carrying out the preferred embodiment of the invention has been illustrated and described in detail, those familiar with the art to which the invention relates will recognize various alternative designs and embodiments which fall within the spirit of practicing the invention. The appended claims are intended to cover all those changes and modifications falling within the true spirit and scope of the present invention.

That which is claimed is:

1. An information management and synchronous communications system for use with wireless handheld computing devices and the internet comprising:

- a. a central database containing informational session applications and data,
- b. at least one wireless handheld computing device on which informational session applications and data are stored,
- c. at least one Web server on which informational session applications and data are stored,
- d. at least one Web page on which informational session applications and data are stored,
- e. an application program interface, and
- f. a communications control module,

wherein applications and data are synchronized between the central data base, at least one wireless handheld computing device, at least one Web server and at least one Web page; wherein the application program interface enables integration of outside applications with the informational session applications and wherein the communications control module is an interface between the informational session applications and any other communications protocol.

2. The information management and synchronous communications system of claim 1 wherein the communications control module provides a single point of entry for all informational session applications and wherein the single point of entry allows the synchronization of at least one wireless handheld computing device and at least one Web page with the central database so that at least one handheld device, at least one Web page and central database are consistent.

3. The information management and synchronous communications system of claim 2 wherein information entered on at least one Web page and transmitted over the internet is automatically communicated to the central database and at least one wireless handheld computing device.

4. The information management and synchronous communications system of claim 2 wherein information entered on at least one wireless handheld computing device is automatically communicated to the central database and at least one Web page.

5. The information management and synchronous communications system of claim 1 wherein the applications and data are synchronized by digital data transmission between the central database, at least one wireless handheld computing device, at least one Web server and at least one Web page.

6. The information management and synchronous communications system of claim 1, wherein investment informational session data is synchronized.

7. The information management and synchronous communications system of claim 1, wherein insurance informational session data is synchronized.

8. The information management and synchronous communications system of claim 1, wherein employee program informational session data is synchronized.

9. The information management and synchronous communications system of claim 1, wherein enrollment functionality is provided.

10. The information management and synchronous communications system of claim 1, wherein relationship management functionality is provided.

11. The information management and synchronous communications system of claim 1, wherein report generation functionality is provided.

12. The information management and synchronous communications system of claim 1, wherein informational session monitoring functionality is provided.

13. The information management and synchronous communications system of claim 1, wherein session attendee interactive functionality is provided.

14. The information management and synchronous communications system of claim 1, wherein language conversion functionality is provided.

15. An information management and synchronous communications system for generating and transmitting menus comprising:

- a. a central processing unit,
- b. a data storage device connected to said central processing unit,
- c. an operating system including a graphical user interface,
- d. a first menu consisting of menu categories, said menu categories consisting of menu items, said first menu stored on said data storage device and displayable in a window of said graphical user interface in a hierarchical tree format,
- e. a modifier menu stored on said data storage device and displayable in a window of said graphical user interface,
- f. a sub-modifier menu stored on said data storage device and displayable in a window of said graphical user interface, and
- g. application software for generating a second menu from said first menu and transmitting said second menu to a wireless handheld computing device or Web page,

wherein the application software facilitates the generation of the second menu by allowing selection of categories and items from the first menu, addition of menu categories to the second menu, addition of menu items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of said operating system, said parameters being selected from the modifier and sub-modifier menus, wherein one or more of the menus relate to informational session functionality.

16. An information management and synchronous communications system in accordance with claim 15, wherein the second menu is capable of being displayed on the display screen of a wireless computing device.

17. An information management and synchronous communications system in accordance with claim 16, wherein selections from the second menu are capable of being transmitted to a receiving computer by wireless link.

18. An information management and synchronous communications system in accordance with claim 16, wherein selections from the second menu are capable of being transmitted to a receiving computer via the internet.

19. An information management and synchronous communications system in accordance with claim 15, wherein the second menu is capable of being displayed on display screens of computers in a network.

20. An information management and synchronous communications system in accordance with claim 19, wherein the computer network is the internet.

21. An information management and synchronous communications system in accordance with claim 15, wherein the second menu is created in conformity with hypertext markup language or extensible markup language.

22. An information management and synchronous communications system in accordance with claim 15, wherein the second menu overwrites the first menu.

23. The information management and synchronous communications system of claim 15, wherein the first menu and the second menu are both capable of being displayed in the same window on the display screen.

24. The information management and synchronous communications system of claim 15, wherein the menu categories and items comprising the second menu are subsets, respectively, of the menu categories and items comprising the first menu.

25. The information management and synchronous communications system of claim 15, wherein one or more of the menus relate to investment informational session functionality.

26. The information management and synchronous communications system of claim 15, wherein one or more of the menus relate to insurance informational session functionality.

27. The information management and synchronous communications system of claim 15, wherein one or more of the menus relate to employee program informational session functionality.

28. The information management and synchronous communications system of claim 15, wherein enrollment functionality is provided.

29. The information management and synchronous communications system of claim 15, wherein relationship management functionality is provided.

30. The information management and synchronous communications system of claim 15, wherein report generation functionality is provided.

31. The information management and synchronous communications system of claim 15, wherein informational session monitoring functionality is provided.

32. The information management and synchronous communications system of claim 15, wherein session attendee interactive functionality is provided.

33. The information management and synchronous communications system of claim 15, wherein language conversion functionality is provided.

34. An information management and synchronous communications system for generating and transmitting menus comprising:

- a. a central processing unit,
- b. a data storage device connected to said central processing unit,
- c. an operating system including a graphical user interface,
- d. a first menu consisting of menu categories, said menu categories consisting of menu items, said first menu stored on said data storage device and displayable in a window of said graphical user interface in a hierarchical tree format,
- e. a modifier menu stored on said data storage device and displayable in a window of said graphical user interface,
- f. a sub-modifier menu stored on said data storage device and displayable in a window of said graphical user interface, and
- g. application software for generating a second menu from said first menu and transmitting said second menu to a wireless handheld computing device or Web page,

wherein the application software facilitates the generation of the second menu by allowing selection of categories and items from the first menu, addition of menu categories to the second menu, addition of menu items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of said operating system, said parameters being selected from the modifier and sub-modifier menus, wherein said second menu is manually modified after generation, wherein one or more of the menus relate to informational session functionality.

35. The system of claim 34 wherein the modified second menu can be selectively printed on any printer directly from the graphical user interface of a hand-held device.

36. An information management and synchronous communications system for generating menus comprising:

- a. a central processing unit,
- b. a data storage device connected to said central processing unit,
- c. an operating system including a graphical user interface,
- d. a first menu stored on said data storage device,
- e. application software for generating a second menu from said first menu,

wherein the application software facilitates the generation of the second menu by allowing selection of items from the first menu, addition of items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of said operating system and wherein data comprising the second menu is synchronized between the data storage device connected to the central processing unit and at least one

other computing device, wherein said second menu is manually modified by handwriting or voice recording after generation, wherein one or more of the menus relate to informational session functionality.

37. An information management and synchronous communications system for generating menus comprising:

- a. a microprocessor,
- b. a display device,
- c. a data and instruction input device,
- d. a data storage device for storing information and instructions entered through said data and instruction input means or information generated by said microprocessor,
- e. an operating system,
- f. a master menu stored on said data storage device for generating a modified menu, and
- g. application software,

wherein said microprocessor, operating system and application software are operative to display the master menu on the display device in response to instructions programmed into said microprocessor, operating system, application software and information and instructions entered through said data input device, and wherein said microprocessor, operating system and application software are operative to create the modified menu from said master menu in response to information and instructions entered through said data and instruction input device and wherein data comprising the modified menu is synchronized between the data storage device and at least one other computing device, wherein said modified menu is manually modified after generation, wherein one or more of the menus relate to informational session functionality.

38. The information management and synchronous communications system of claim 34, 36, or 37 wherein the manual modification involves handwriting capture.

39. The information management and synchronous communications system of claim 34, 36, or 37 wherein language conversion functionality is provided.

40. The system of claim 38 wherein the handwriting capture involves handwriting recognition and conversion to text.

41. The information management and synchronous communications system of claim 34, 36, or 37 wherein the manual modification involves voice capture.

42. The system of claim 41 wherein the voice capture involves voice recognition and conversion to text.

43. The system of claim 36 or 37 wherein the modified second menu can be selectively printed on any printer directly from the graphical user interface of said other computing device.

44. In a computer system having an input device, a storage device, a video display, an operating system including a graphical user interface and application software, an information management and synchronous communications method comprising the steps of:

- a. outputting at least one window on the video display;
- b. outputting a first menu in a window on the video display;

- c. displaying a cursor on the video display;
- d. selecting items from the first menu with the input device or the graphical user interface;
- e. inserting the items selected from the first menu into a second menu, the second menu being output in a window;
- f. optionally adding additional items not included in the first menu to the second menu using the input device or the graphical user interface;
- g. storing the second menu on the storage device; and

synchronizing the data comprising the second menu between the storage device and at least one other data storage medium, wherein the other data storage medium is connected to or is part of a different computing device, and wherein said second menu is manually modified after generation, wherein one or more of the menus relate to informational session functionality.

45. The method of claim 44 wherein the manual modification involves handwriting capture.

46. The method of claim 45 wherein the handwriting capture involves handwriting recognition and conversion to text.

47. The method of claim 44 wherein the manual modification involves voice capture.

48. The method of claim 47 wherein the voice capture involves voice recognition and conversion to text.

49. The method of claim 44 wherein language conversion functionality is provided.

50. An information management and synchronous communications system, comprising:

- a. a central database containing informational session applications and data,
- b. an informational session attendee computing device,
- c. an informational session leader computing device,
- d. an application program interface, and
- e. a communications control module,

wherein the informational session attendee computing device provides informational session interactive functionality;

wherein the informational session leader computing device provides informational session monitoring functionality;

wherein applications and data are synchronized between the central data base and at least one of the computing devices; wherein the application program interface enables integration of outside applications with the informational session applications, wherein the communications control module is an interface between the informational session applications and any other communications protocol, and wherein the synchronized data includes enrollment data.

51. The information management and synchronous communications system of claim 50, wherein investment informational session data is synchronized.

52. The information management and synchronous communications system of claim 50, wherein insurance informational session data is synchronized.

53. The information management and synchronous communications system of claim 50, wherein employee program informational session data is synchronized.

54. The information management and synchronous communications system of claim 50, wherein the informational session attendee computing device provides enrollment functionality.

55. The information management and synchronous communications system of claim 50, wherein relationship management functionality is provided.

56. The information management and synchronous communications system of claim 50, wherein report generation functionality is provided.

57. The information management and synchronous communications system of claim 50, wherein the informational session leader computing device provides session attendee communication functionality.

58. The information management and synchronous communications system of claim 50, wherein the informational session interactive functionality provides goal identification functionality.

59. The information management and synchronous communications system of claim 50, wherein the informational session interactive functionality provides what-if analysis functionality.

60. The information management and synchronous communications system of claim 50, wherein language conversion functionality is provided.

61. An information management and synchronous communications system, comprising:

- a. a central database containing informational session applications and data,
- b. an informational session attendee computing device on which informational session applications and data are stored,
- c. an informational session leader computing device on which informational session applications and data are stored,
- d. at least one Web server on which informational session applications and data are stored,
- e. at least one Web page on which informational session applications and data are stored,
- f. an application program interface, and
- g. a communications control module,

wherein applications and data are synchronized between the central data base, at least one of the computing devices, at least one Web server and at least one Web page; wherein the application program interface enables integration with the informational session applications and wherein the communications control module is an interface with the informational session applications.

62. The information management and synchronous communications system of claim 61, wherein investment informational session data is synchronized.

63. The information management and synchronous communications system of claim 61, wherein insurance informational session data is synchronized.

64. The information management and synchronous communications system of claim 61, wherein employee program informational session data is synchronized.

65. The information management and synchronous communications system of claim 61, wherein enrollment functionality is provided.

66. The information management and synchronous communications system of claim 61, wherein relationship management functionality is provided.

67. The information management and synchronous communications system of claim 61, wherein report generation functionality is provided.

68. The information management and synchronous communications system of claim 61, wherein informational session monitoring functionality is provided.

69. The information management and synchronous communications system of claim 61, wherein session attendee interactive functionality is provided.

70. The information management and synchronous communications system of claim 61, wherein language conversion functionality is provided.

71. An information management and synchronous communications system for use with wireless handheld computing devices and the internet comprising:

- a. a central database containing hospitality applications and data,
- b. at least one wireless handheld computing device on which hospitality applications and data are stored,
- c. at least one Web server on which hospitality applications and data are stored,
- d. at least one Web page on which hospitality applications and data are stored,
- e. an application program interface, and
- f. a communications control module,

wherein applications and data are synchronized between the central data base, at least one wireless handheld computing device, at least one Web server and at least one Web page; wherein the application program interface enables integration of outside applications with the hospitality applications; wherein the communications control module is an interface between the hospitality applications and any other communications protocol; and wherein language conversion functionality is provided.

72. An information management and synchronous communications system for generating and transmitting menus comprising:

- a. a central processing unit,
- b. a data storage device connected to said central processing unit,
- c. an operating system including a graphical user interface,
- d. a first menu consisting of menu categories, said menu categories consisting of menu items, said first menu stored on said data storage device and displayable in a window of said graphical user interface in a hierarchical tree format,
- e. a modifier menu stored on said data storage device and displayable in a window of said graphical user interface,
- f. a sub-modifier menu stored on said data storage device and displayable in a window of said graphical user interface, and
- g. application software for generating a second menu from said first menu and transmitting said second menu to a wireless handheld computing device or Web page,

wherein the application software facilitates the generation of the second menu by allowing selection of categories and items from the first menu, addition of menu categories to the second menu, addition of menu items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of said operating system, said parameters being selected from the modifier and sub-modifier menus; and wherein language conversion functionality is provided.

73. An information management and synchronous communications system for use with wireless handheld computing devices, comprising:

- a. a central database containing informational session applications and data,
- b. at least one wireless handheld computing device on which informational session applications and data are stored,
- c. an application program interface, and
- d. a communications control module,

wherein applications and data are synchronized between the central data base and at least one wireless handheld computing device; wherein the application program interface enables integration of outside applications with the informational session applications and wherein the communications control module is an interface between the informational session applications and any other communications protocol.

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