(54) Title: ADAPTIVE BEHAVIOR MODIFICATION SYSTEM WITH INTELLIGENT AGENT

(57) Abstract: An adaptive behavior modification system providing a personalized behavior modification program and assisting a user in complying with the behavior modification program by continuously learning about the user and providing information, advertisements, and products that aid the user in achieving desired goals through behavior modification. The server obtains user profile information

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and creates a personalized behavior modification program based on the user profile information. The server further provides one or more behavior modification tools for complying with the behavior modification program. As the user participates in his or her program, the server monitors such participation and invokes a software program for searching a database based on the user profile and user participation information. The software program preferably searches local databases, the Internet, and local area networks for information, resources, and products that will assist the user in complying with the behavior modification program. The server filters and sorts the information retrieved by the software program, and integrates it into the behavior modification tools. The server may modify the behavior modification program and/or user profile information based on the user participation information. The server may also monitor the user interactions with the behavior modification tools, and invoke the software program to search the database based on the user interaction information.
FIELD OF THE INVENTION

The present invention relates generally to behavior modification systems, and more particularly to a computer-implemented behavior modification system that provides behavior modification tools, information, and resources customized to the needs and preferences of the users of the system.

BACKGROUND OF THE INVENTION

Every individual has fundamental set of core needs including, for example, health, security, and community. These needs can further be prioritized: more fundamental needs are preferably met first to insure survival. Once these needs have been satisfied, the individual can address and satisfy other core needs essential to his or her happiness and sense of fulfillment. In order to satisfy core needs, individuals must often make lifestyle changes. For example, individuals who are recovering from a surgical procedure such as a heart bypass, or are suffering from diabetes, must often make lasting lifestyle changes in order to satisfy the core need for health and wellness. Even people who do not suffer from particular ailments are known to benefit from healthy eating, exercise, and stress management. Individuals who are successful in making and adhering to positive lifestyle changes are likely to benefit from increased vitality, well-being, and self-confidence. Health and wellness can therefore provide the foundation for an individual to go on to satisfy other important but less fundamental needs, such as those involving career goals and other forms of self-expression.

At present, however, most programs for helping individuals make lifestyle changes involve doctors' visits, self-help programs, seminars, or literary materials that provide information to the individual about the benefits of behavior modification and lifestyle change. These conventional methods are often ineffective in causing behavior modification because there is little or nothing in the way of an on-going support mechanism to assist the individual in making the recommended
behavior modification. Furthermore, there is little integration of these behavior modification programs with the daily routines of an individual’s life. The described methods are therefore insufficient for motivating the user to make the recommended changes, and further insufficient for monitoring compliance with such recommendations.

Accordingly, there is a need for a behavior modification, compliance monitoring, and feedback system that is able to effectively motivate individuals to participate in a behavior modification program designed to assist individuals to satisfy their core needs. Such a system should continuously collect and update user profile information and provide behavior modification tools, resources, and information that is catered to the individual users for further motivating the user to make the recommended changes.

SUMMARY OF THE INVENTION

The present invention addresses and alleviates the above-mentioned deficiencies associated with the prior art. More particularly, the present invention is directed to a computer-implemented system and method for assisting a user in complying with a behavior modification program by learning about the user and providing information, advertisements, and products that may aid the user to achieve desired goals through behavior modification.

According to one aspect of the invention, the server obtains user profile information and creates a personalized behavior modification program based on the user profile information. The server further provides one or more behavior modification tools for complying with the behavior modification program. As the user participates in his or her program, the server monitors such participation and invokes a software program for searching a database based on the user profile and user participation information. The server filters and sorts the information retrieved by the software program, and integrates it into the behavior modification tools.

In one particular aspect of the invention, the server modifies the behavior modification program and/or user profile
information based on the user participation information.

In another particular aspect of the invention, the server monitors the user interactions with the behavior modification tools, and invokes the software program to search the database based on the user interaction information.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram of an adaptive behavior modification system according to one embodiment of the invention;

FIG. 2 is a flow diagram of an exemplary process undertaken by an adaptive behavior modification server;

FIG. 3 is an exemplary GUI for entering a new member’s profile information;

FIG. 4 is an exemplary screen illustrating the types of medical information that may be entered as part of a member’s profile information;

FIG. 5 illustrates an exemplary screen image of member’s medication information;

FIG. 6 is an exemplary GUI for entering a member’s interests in making a lifestyle change;

FIG. 7 is an exemplary GUI for specifying vital statistics information to be tracked by a member;

FIG. 8 illustrates an exemplary screen allowing formulation of an exercise program for a member;

FIG. 9 illustrates an exemplary nutrition program for a member; and

FIG. 10 illustrates an exemplary home page provided by a personal portal.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is a schematic diagram of an adaptive behavior modification system according to one embodiment of the invention. The system includes an adaptive behavior modification server 10 in communication with user devices 12 via a wide area network such as the Internet 14. The user devices 12 include personal computers, television and set-top-box units, and/or mobile terminals with Internet capabilities. These user devices 12 preferably access the Internet 14 via telephone lines,
satellites, television cable systems, and the like.

The server 10 preferably hosts one or more mass storage devices 24 which may take the form of a hard disk drive, or drive array. The mass storage device 24 stores a number of purpose-built databases and files useful for implementation of the present system. Such databases and files include user profile information as well as information and resources related to behavior modification.

Other servers and platform computers 16 communicate with the adaptive behavior modification server 10 via the Internet 14 to provide information and resources preferably related to behavior modification. It should be apparent to those skilled in the art, however, that the server and platform computers 16 may provide any other types of information and resources requested by the server 10. The adaptive behavior modification server 10 also accesses a mass storage device 24 and communicates with local servers and computers 18 via a local area network 20 to retrieve local information and resources. A case advisor may further access the server 10 using a computer 18 in the local area network 20.

The server 10 preferably includes an expert system 30 module, an intelligent agent 32 module, and a behavior modification system 31 module. The expert system 30 provides a graphics user interface (GUI) for requesting and receiving user data from the users of the system. The GUI is accessible to the users via the user devices 12.

The expert system 36 creates and stores a user profile for each user in its mass storage device 24 based on the information provided by the user. The expert system 30 further monitors and determines user behavior patterns and uses such information to continuously update and adjust the profile information. These updates allow a better representation of the preferences, interests, needs, and behavior modification areas of each user.

The server 10 uses the user profile information to periodically invoke the intelligent agent 32 to search the databases of one or more of its local mass storage devices 24, the Internet 14, and/or the local area networks 20, and gather information and resources of aid and interest to the user. The
intelligent agent 32 is preferably a software applet that resides in the server 10. Alternatively, the intelligent agent 32 resides in a separate computer in communication with the server 10. According to one embodiment of the invention, the software applet is written in the Java™ programming language developed by Sun Microsystems. The software applet may also be written using Active™, a technology from Microsoft, or other known Internet programming technologies.

The behavior modification system 31 module allows a user to participate in his or her personalized behavior modification program preferably via a personal portal, as is described in further detail in Applicant’s co-pending U.S. application Ser. No. 09/327,905 (attorney docket number 33694), which is fully incorporated herein by reference. The personal portal incorporates behavior modification tools, resources, and information. The personal portal preferably infuses the Web portal site concept with a new depth of personalization. It encourages use of the server 10 for behavior modification necessary to satisfy the core needs of the user by conveniently providing, in a centralized location, access to the behavior modification tools and educational materials, as well as customizable access to Internet sites and other sources of information which suit the individual interests and needs of the user. The user is, therefore, likely to be naturally drawn to the personal portal as part of his or her everyday activities. The textual and graphical prompts further motivate usage of the tools and educational materials provided by the personal portal. The various behavior modification tools may include an electronic journal, meeting room, kitchen, gym, tranquility park, and library.

FIG. 2 is a flow diagram of an exemplary process undertaken by the present adaptive behavior modification server 10. In step 30, the expert system 30 gathers information about a user desiring to register onto the system by prompting the user to answer explicit questions regarding the user’s lifestyle via the GUI. The user responses are stored in a user database in the mass storage device 24. The user database preferably includes user data records unique to each registered user of the system.
Each user record is preferably headed and identified by a unique user ID. Each user record further includes a field for storing responses to each of the profile questions posed by the server. Exemplary questions posed by the expert system 30 relate to the user's name, gender, marital status, ethnic background, and education. The expert system 30 may further pose business profile questions to obtain information about the user's current work status, including the number of hours worked per week, and the number of days the user was absent from work. The expert system 30 may also inquire about the user's medical profile. Such questions may relate to the user's resting heart rate, blood pressure, cholesterol level, current medication, and any pain that the user is currently suffering. In addition, the expert system 30 may present other health-related questions such as the amount of alcohol consumed, stress received from work, stress reduction techniques being exercised, and quality of family and social life.

The expert system 30 may further inquire about the user interests in making behavior modifications. In doing so, the expert system 30 preferably asks the user to rate his or her interests in exercising, losing weight, quitting smoking, managing stress, changing diet, improving relationships, managing alcohol or drug use, and other lifestyle issues. In an alternative embodiment, the user may also indicate an interest in making behavior modifications to reach certain non-health related goals, such as gaining self-confidence, being a more efficient worker, and the like.

To further allow the expert system to assess the user's health risk as well as the user's diet and psychological health, the expert system preferably presents several questionnaires to the user. According to one embodiment of the invention, such questionnaires are related to the user's health, diet, and psychological status. Other questionnaires may also be administered, including those revolving around user preferences, tastes, hobbies, and the like.

The questionnaires may be administered on-line or off-line. If the questionnaires are administered on-line via the GUI provided by the expert system 30, the user input is sorted and
stored directly into the user record. If the questionnaires are administered off-line, the questionnaires are mailed to the user, or communicated to the user via other known communication means. In this scenario, a case manager preferably enters the user responses into the user record database once the user completes the questionnaires and returns them to the case manager.

The health-risk assessment questionnaire inquires about the user’s current health and medical history, and is preferably more detailed than the profile questions posed by the expert system upon user registration. Exemplary health risk questions in the questionnaire relate to the user’s family health history, personal health history, health symptoms, physical activity, eating practices, safety practices, medical care, and the like. User responses to the questionnaire are also stored into the user’s database record.

The other questionnaires presented to the user may relate to the user’s diet and psychological health, and are also more detailed than the initial profile questions presented by the expert system. The responses to these questionnaires are also stored into the user’s database record.

The diet assessment questionnaire may inquire how often and how much food is consumed by the user. The psychological assessment questionnaire may provide a list of various emotional and psychological manifestations, and inquire how distressed the user is because of such manifestations. An exemplary list of emotional and psychological manifestations include feeling fearful, thoughts of ending one’s life, crying easily, overeating, feelings of guilt, feeling urges to beat, injure or harm someone, feeling afraid of open spaces or on the streets, feeling lonely, and the like.

In step 36, the expert system performs a health risk assessment in view of the user responses to the general profile questions and/or the health-risk assessment questionnaire, and develops a user profile for the user. According to one embodiment of the invention, the server integrates third party tools to perform the health-risk assessment. One exemplary third party tool is entitled PERSONAL WELLNESS PROFILE – COMPREHENSIVE ASSESSMENT, and is commercially available from Wellsource, Inc.
The expert system 30 preferably also performs dietary and psychological assessments of the user based on the responses to the diet and psychological health questionnaires. The server 10 may utilize third party tools to perform the dietary and psychological assessments. An exemplary tool for performing the dietary assessments is Quick Check for Diet Progress, commercially available from Nutrition Scientific of Pasadena, California. An exemplary tool for performing psychological assessments is SCL-90-R, available from National Computer Servers, Inc. of Minneapolis, Minnesota. In an alternative embodiment of the invention, the user’s health, diet, and psychological assessments are performed by a single tool residing in or outside the server 10.

After assessment of the user’s health, diet, and/or psychological health, the expert system 30, in step 38, creates a behavior modification program catered to the particular individual, as is described in further detail in the above-referenced U.S. application Ser. No. 09/327,905. The behavior modification program is designed to meet one or more user-specified goals. Such goals may not only relate to prevention or recovery of physical ailments, but also relate to behavior modification for psychological and emotional well-being. For instance, the behavior modification program may aid a user in his or her mental health recovery or recovery from alcoholism or drug addiction.

As the user participates in his or her behavior modification program and interacts with the various aspects of the server 10 via the personal portal, the expert system 30, in step 40, determines the user’s behavior patterns and updates/modifies the user’s profile information. The user also provides express feedback to the server 10 of his or her progress with the behavior modification program for further allowing the updating of the user’s profile. With a more detailed knowledge of the user’s habits and progress, the server 10 is better able to adapt to the needs of the user, and provide greater assistance in achieving the desired behavior modification.

According to one embodiment of the invention, the expert system 30 monitors the user’s behavior by performing a log
analysis of the user's interaction with the personal portal site. Third party tools such as ARIA, which is commercially available from Andromedia, Inc., of San Francisco, California, is used to perform the log analysis.

Alternatively, the expert system 30 invokes its own log analysis algorithm. In doing so, the expert system maintains a unique click ID for each item on the portal site that may be selected by the user. As the user accesses the various items on the site, the expert system 30 stores the corresponding click IDs into a user queue. At the end of the day, the information on the queue is stored into a user log that the expert system 30 uses to perform its log analysis. In its most elementary form, the log analysis includes a calculation of the percentage of use of each of the resources provided by the server 10. For instance, the log analysis may indicate that the user has selected the tranquility park tool for participating in stress management activities, seventy percent of the time. Based on such information, the expert system 30 deduces that the user is suffering from high amounts of stress, and increases the user's stress level indication accordingly in the user's record.

In another example, if the user constantly selects documents in the server's internal library dealing with smoking cessation, the server 10 may deduce that the user seeks to stop smoking, and may enter this as a desired goal even if the user has not expressly indicated so. The user's behavior modification program, tools, and information pushed to the user may further be updated based on such a conclusion.

The server 10 uses the log analysis not only to determine the items that the user is selecting on the portal site, but also to determine which items are being avoided by the user. The server 10 may remove avoided items from the portal site, or provide additional motivation to the user to draw those items to the user. For instance, if the user is participating in a weight loss program, but avoids the exercise tool that provides the user's individualized exercise program, the server 10 may transmit a memo to the user, via electronic e-mail or other communication means, reminding the user to participate in the exercise program.
In addition to log analysis, the expert system 30 can also gain implicit information about the user based on the search words supplied by the user. Accordingly, the expert system 30 maintains for each user a separate file of all search words submitted to the server 10, as well as a file of the search results produced. The file of search results further provides information as to the search result items that the user has selected for viewing. The expert system 30 may also include meta tags associated with such viewed items into the user’s keyword file to gather further knowledge about the user.

And yet another way to gain implicit knowledge about a user is via collaborative filtering. According to this method, the expert system 30 makes assumptions about the current user based on its knowledge about other users with similar preferences. According to this method, the expert system 30 identifies users with preferences similar to those of the target individual. As the expert system 30 gains additional knowledge of the preferences of the other users from the items that they have viewed, purchases that they have made, and promotions that they have responded to, the expert system assumes that the target individual is also likely to be interested in such products and advertisement materials.

According to one embodiment of the invention, the expert system 30 integrates third party tools to gather the implicit data and perform various personalization tasks. One exemplary personalization tool is LIKEMINDS 3.0, commercially available from Andromedia, Inc., of San Francisco, California.

As the expert system 30 gains knowledge about user preferences, habits, and patterns, the server 10, in step 42, deploys the intelligent agent 32 to search the databases in one or more internal mass storage devices 24, the Internet 14, and local area networks 20, for information, products, advertisements, and resources that the user may be interested in. In step 44, the expert system 30 filters and sorts the results of the search based on subject matter, date, or the like. In step 46, the expert system integrates the information and resources gathered by the intelligent agent 32 into the behavior modification system 31 for access by the user via the personal
portal. For example, personalized articles and website links retrieved by the intelligent agent 32 may be made accessible through the electronic library. The intelligent agent 32 may also populate the electronic kitchen with relevant nutritional information, as well as recipes complying with the user’s behavior modification program that caters to the user’s tastes. The electronic gym may display exercises retrieved by the intelligent agent that match the user’s interests and complies with the user’s behavior modification program. The intelligent agent 32 may further search the Internet for new relaxation techniques that suit the particular user for inclusion into the server’s tranquility park.

According to one embodiment of the invention, the intelligent agent 32 is invoked once or several times a day. For instance, the server 10 may invoke the intelligent agent 32 once a day to gather up-to-date news articles that may be of interest to the particular user of the system. In doing so, the server 10 examines the explicit and implicit information gathered about the user as well as the user’s behavior modification program, and formulates search keywords that the intelligent agent can use to search one or more Internet 14 news sites.

For example, if the user is a smoker who has indicated a desire to stop smoking, and is furthermore participating in a smoking cessation program, the intelligent agent 32 searches the Internet 14 for the day’s articles pertaining to the smoking topic. These articles are then presented to the user through his or her personal portal. The intelligent agent may also perform regular searches of the Internet 14 for other information that the user may be interested based on the user profile information.

The intelligent agent 32 is also preferably invoked upon the detection of particular events. For instance, the server 10 may invoke the intelligent agent 32 upon detecting the user’s failure to meet certain behavior modification program milestones. In this scenario, the intelligent agent 32 searches the local databases, Internet 14, and/or local area networks 20, for resources that will aid the user in complying with his or her behavior modification program. If the expert system 30 detects, for example, from the feedback provided by the user, that the
user is smoking three cigarettes a day when his or her smoking cessation program indicates that the user should be smoking only one, the intelligent agent 32 locates and pushes advertisements of products that may aid the user to meet his goals, and/or Web site links and articles relevant to smoking cessation. The articles and Web site links may be geared, for instance, to tips on how to overcome the urges to smoke. The advertisements may be geared towards nicotine patches or an innovative medication to help kick the smoking habit. The articles and information are then provided via the personal portal. The products advertised may also be included into a website store accessible through the personal portal.

Under the collaborative filtering method, the intelligent agent further detects the items that have been viewed by users with similar preferences, purchases that they have made, and promotions that they have responded to, and also pushes those products and advertisements to the user. These products may also be added to the system's website store.

As the user participates in his or her personal behavior modification program, the server 10 continuously provides motivation to users to comply with designated program milestones, and adapts each program according to user feedback, needs, and/or preferences. In providing motivation to users, the server 10 not only invokes the intelligent agent 32 to search and push relevant information and products to the user, but also provides an electronically-implemented support mechanism to aid and motivate the user in effectuating the desired behavior modification. Such support mechanism is provided by the electronic journal, meeting room, kitchen, gym, tranquility park, and library.

The user may manually invoke and utilize the behavior modification tools provided by the server 10. Alternatively, the server 10 invokes the intelligent agent 32 to automatically invoke the tools based on user needs. For instance, the intelligent agent 32 may schedule the individual on additional electronic group meetings and mentoring sessions if the individual is not achieving the desired milestones.

The expert system 30 continuously adapts the user's behavior modification program and tools based on user feedback, needs,
and/or preferences. For instance, the expert system 30 may gain implicit knowledge that the user likes swimming based on website searches being performed, on-line purchases being made, and the articles being viewed. If this user is on a weight-loss program, and further does not regularly participate in his aerobic exercise program, the expert system 30 may design a new exercise program geared towards swimming. Additionally, the expert system 30 may detect a need to switch to a low impact exercise program upon learning that the user has received knee surgery.

The expert system 30 further adapts to positive progresses made by users in their respective behavior modification programs. For instance, if a user has been performing an exercise routine diligently for a couple of months, the expert system 30 may add additional or more challenging exercises to that routine.

Thus, as a user’s profile evolves and changes with time, the expert system 30 adapts to such changes to address the current needs and preferences of the user. The expert system 30 continuously learns about the user through the user’s interaction with the server 10. Given such knowledge, the intelligent agent 32 can search for information that will cater to the individual needs and preferences of the user. Such information is integrated into the server’s behavior modification system 31 for assisting the user in achieving desired goals through behavior modification.

FIG. 3 is an exemplary GUI accessible to a case advisor via a computer 18 in the local area network 20 for entering the profile information of a new member desiring to enroll in a behavior modification program. The server 10 may provide a similar GUI to the users in order for them to enter the information directly via the user devices 12.

A new member’s personal contact information including his or her user ID and password is entered by actuating a Personal information option 2000. Actuating a Medical information option 2002 allows addition of the individual’s medical information. FIG. 4 is an exemplary screen illustrating the types of medical information that may be entered for the individual. Such information may include, for example, information as to the individual’s height, weight, heart rate, blood type, cholesterol
level, and the like. The desired goals, such as a goal weight 2004, may also be input if relevant.

The server 10 further allows entry of the individual’s medication information by actuating a Medication information option 2006. FIG. 5 illustrates an exemplary screen image of an individual’s medication information. This information may be updated by actuating an Update Medication button 2008. Furthermore, a Reminder Service option 2010 allows the server 10 to send reminders to the individual when it is time to take the medication. Reminders may be sent via pager, e-mail, phone, or any other known communication method.

FIG. 6 is an exemplary GUI accessible to the case advisor and/or individual member for entering the member’s interests in making a lifestyle change. Such interests are preferably represented as a set of behavior modification goals 2014. The goal information is entered by actuating a Goal option 2012. The member is preferably rated as being very interested, moderately interested, somewhat interested, not very interested, or not at all interested (referred generally at 2016) in reaching the behavior modification goal(s). Any goal updates during the user’s participation in the behavior modification program is entered by actuating an Update button 2018.

FIG. 7 is an exemplary GUI accessible to the case advisor for specifying the vital statistics 2019 that are to be tracked by the member while participating in the behavior modification program as well as the frequency 2020 of the tracking. The user preferably keeps track of his or her vital statistics in the electronic journal accessed via the personal portal.

The type of vital statistics to be tracked preferably varies based on the goal that the user is trying to achieve. The frequency of the tracking may also vary based on the particular vital statistics. For instance, the user’s weight may be tracked once a week while his or her waist size may be tracked every month. A Submit button 2021 submits the completed vital statistics information for storage in the mass storage device 24. The submitted information is then available to the server 10 for correlating with the milestones in the behavior modification program and determining whether the user is complying with the
program. In addition, the case advisor or another health advisor may modify the program as necessary upon review of the submitted data.

Referring now to FIGS. 8 and 9, the case advisor may also select an exercise program, a nutrition program, a stress management program, and a support group meeting program to help users achieve their behavior modification goals. FIG. 8 is an illustration of a screen allowing formulation of an exercise program for an individual. An Exercise 2022 option permits the case advisor to determine the types of exercises the user should perform and the repetitions for each exercise, to achieve the program goals. The types of exercises recommended as well as the number of repetitions for each exercise depends on the information provided by the user for being enrolled in the system. Thus, different exercise programs might be recommended for users with different weights, different physical conditions, and different health histories. For instance an exercise program recommended for a user with back problems might differ from an exercise program of a user who does not have such an ailment.

The case advisor may also select a nutrition program using the system's Nutrition 2024 option. FIG. 9 illustrates an exemplary nutrition program detailing the amount of calories, fat, cholesterol, sodium, fiber, etc. that the user should consume to achieve his or her goals 2026. The system preferably selects the nutritional program that is personalized for a particular user upon correlation of information pertaining to the user such as age, sex, weight, health information, medication information, and the like. For instance, if the user is recovering from a recent heart attack, the nutritional program selected might allow for only a low amount of cholesterol in the user's diet. A Modify 2028 button allows the case advisor to change the nutrition program based on the individual's progress with his or her program.

FIG. 10 illustrates a home page provided by the personal portal according to a presently preferred embodiment. As illustrated in FIG. 10, the personal portal allows the home page to be organized as a cover page of a newspaper providing access to Internet sites, intranet sites, or other sources of
information that suit the individual interests of the user. The server 10 preferably updates the information provided on the home page on a daily basis as is done in a conventional newspaper. A person skilled in the art should realize, however, that the updates might occur several times a day, or on a weekly or monthly basis.

The personal portal also provides the home page with links 3022 to other sites of interest via icons, buttons, menu items or other types of select mechanisms. The category of sites identified by the Internet links 3022 are customizable based on the particular user’s profile information that is obtained and modified over time. In the illustrated example, the Internet links 3022 pertain to shopping, stocks, education, sports, travel, and horoscope.

The information provided to the user through the customized links are also personalized based on the user profile information. In this regard, the intelligent agent 32 searches various information sources and retrieves articles, advertisements, e-commerce opportunities, and links to Web sites pertinent to the user’s interest and behavior modification program. For instance, if the user is in a smoking cessation program, the personal portal provides articles in a Health News 3002 section pertaining to the topic.

In yet another aspect of personalization, the expert system 30 monitors the user’s progress in his or her behavior modification program, and regularly reconfigures the articles, tools and resources provided to the user based on such progress. If the expert system 30 determines that the user is not meeting the established goals, it provides articles, advertisements, e-commerce and Web site links on the home page that provide additional aids to the user to meet those goals. For instance, if the system determines that the user in a smoking cessation program is smoking three cigarettes a day when the user should be smoking only one, the personal portal provides advertisements of products which may aid the user to stop smoking, as well as Web site links with information relevant to smoking cessation. The articles and Web site links may be geared, for instance, to tips on how to overcome the urges to smoke. The advertisements
may be geared towards nicotine patches or an innovative medication to help kick the smoking habit. The opportunity to purchase such items via e-commerce might also be offered. Such feedback from the personal portal helps reinforce positive behavior and discourage negative behavior. In addition, the expert system 30 may schedule the individual on additional group meetings and mentoring sessions to receive more support and guidance to help the individual comply with the program. Other relaxation and meditation tools may also be provided to help the user fight the urges of smoking.

As another example of how the portal may be personalized, the Horoscope 3024 and Weather 3020 options respectively provide horoscope information based on the user’s birth date and weather information based on the user’s address. A What’s New? section 3008 alerts the user of any additions to the system contents, such as addition of new recipes, new articles, and the like, based on the user’s particular behavior modification program. For instance, a user recovering from a recent heart attack may be informed through the What’s New? section of a new Web site containing information relevant to new discoveries in this area. This information, however, may not be displayed to an individual who is using the system solely to try to stop smoking because it would be irrelevant to such individual.

A Comedy Corner 3018 provides comedy video clips or radio show clips for adding humor to the system and further enticing the individual to use the system on a regular basis.

The personal portal is further integrated with a behavior modification program and provides access to tools and educational materials germane to the program through a main control bar 3026 on the home page. The integration of the personal portal with an individual’s behavior modification program helps promote usage of the system on a regular basis. For instance, a user who enjoys to read the day’s news, check the weather, and further read the horoscope on a daily basis, may now do so through the personal portal rather than through a conventional newspaper. As the user accesses the personal portal to perform his or her daily routine, the user can further access behavior modification tools and educational materials integrated into the personal
portal, making usage of those tools and educational materials also part of the user’s everyday routine. The entertainment aspects of the personal portal, such as the Comedy Corner 3018 and Horoscope 3024 sections, as well as the textual and graphical prompts, provided through the home page, further draw the user to the personal portal and promote its usage on a regular basis. Such regularity and consistency is an important factor in the modification of previously existing behaviors and the adoption of new ones.

The present system may further be integrated with other commercially available software programs, allowing the system to further prioritize and meet the core needs of individuals. For instance, sales and marketing automation tools might be incorporated into the system of a user in the marketing and sales area. The integrated system will not only provide the user with behavior modification tools and resources affecting his health and/or effectiveness as a salesperson, but the sales automation tools integrated into the system might allow the user to utilize the system to record and disseminate customer needs to other company personnel.

In a currently preferred embodiment, a main control bar 3026 is organized around a village motif providing graphical representations of the user’s home ("My Place") 3028, Community 3030, Kitchen 3032, Gymnasium 3034, Park 3036, and Library 3038. The expert system 30 continuously monitors for user selection of an item on the main control bar 3026. If the expert system 30 detects such a selection, it proceeds to perform functions related to the selected item, including the display of a subcontrol bar 3050 with options pertaining to the selected icon. Similarly, the expert system 30 continuously monitors for user selection of an item on the subcontrol bar 3050, and performs functions related to the selected item upon such selection.

According to one embodiment of the invention, the personal portal also incorporates a website store selling products catered to the user’s behavior modification program as well as the user’s preferences. The website store is populated with items retrieved by the intelligent agent 32 during its search of the Internet.

The server 10 further provides additional tools and programs
which may be integrated into the personal portal, allowing the user to use the server to provide assistance in various aspects of the user's life. Exemplary tools that may be integrated into the server include employee assistance tools, productivity enhancement tools, workplace training tools, educational training tools, and the like.

Although this invention has been described in certain specific embodiments, those skilled in the art will have no difficulty devising variations which in no way depart from the scope and spirit of the present invention. It is therefore to be understood that this invention may be practiced otherwise than is specifically described. Thus, the present embodiments of the invention should be considered in all respects as illustrative and not restrictive, the scope of the invention to be indicated by the appended claims and their equivalents rather than the foregoing description.
WHAT IS CLAIMED IS:

1. In a computer network enabling communication between a host computer and a plurality of remote user computers, a method for assisting a user accessing the host computer via one of the remote user computers to comply with a behavior modification program provided by the host computer, the method comprising:
   prompting the user to enter user profile information;
   storing the user profile information in a database hosted by the host computer;
   creating a personalized behavior modification program based on the user profile information;
   providing one or more electronic behavior modification tools for complying with the behavior modification program;
   monitoring user participation in the behavior modification program;
   invoking a software program for searching a remote database based on the user profile and user participation information;
   filtering and sorting information retrieved by the software program; and
   integrating the filtered and sorted information into the electronic behavior modification tools.

2. The method of claim 1 further comprising modifying the behavior modification program based on the user participation information.

3. The method of claim 1 further comprising modifying the user profile information based on the user participation information.

4. The method of claim 1 further comprising:
   monitoring user interaction with the electronic behavior modification tools; and
   invoking the software program for searching the remote database based on the user interaction information.

5. The method of claim 1, wherein the software program searches an Internet source for the information.
6. The method of claim 1, wherein the information aids the user in complying with the behavior modification program.

7. The method of claim 1, wherein the information is advertisement information.

8. The method of claim 1, wherein the information is news information.

9. A system for assisting a user in complying with a behavior modification program provided by a host computer, the system comprising:
   means for obtaining user profile information;
   means for storing the user profile information;
   means for creating a personalized behavior modification program based on the user profile information;
   means for providing one or more electronic behavior modification tools for complying with the behavior modification program;
   means for monitoring user participation in the behavior modification program;
   means for searching a database based on the user profile and user participation information;
   means for filtering and sorting the retrieved information; and
   means for integrating the filtered and sorted information into the electronic behavior modification tool used by the user in complying with the behavior modification program.

10. The system of claim 9 further comprising means for modifying the personalized behavior modification program.

11. The system of claim 9 further comprising means for modifying the user profile information.

12. The system of claim 9 further comprising:
    means for monitoring user interaction with the electronic behavior modification tools; and
    means for searching the database based on the user
interaction information.

13. The system of claim 9, wherein the means for searching a database comprises means for searching an Internet source for the information.

14. The system of claim 9, wherein the information aids the user in complying with the behavior modification program.

15. The system of claim 9, wherein the information is advertisement information.

16. The system of claim 9, wherein the information is news information.

17. A system for assisting a user in complying with a behavior modification program, the system comprising:
   a communications interface for transmitting and receiving data;
   a storage device for storing the received data;
   a processor coupled to the communications interface and the storage device, the processor being operable to execute program instructions including:
   - prompting the user to enter user profile information;
   - storing the user profile information in the storage device;
   - creating a personalized behavior modification program based on the user profile information;
   - providing one or more electronic behavior modification tools for complying with the behavior modification program;
   - monitoring user participation in the behavior modification program;
   - searching a database based on the user profile and user participation information;
   - filtering and sorting the retrieved information; and
   - integrating the filtered and sorted information into the electronic behavior modification tool used by the user in complying with the behavior modification program.
18. The system of claim 17, wherein the program instructions further include modifying the behavior modification program based on the user participation information.

19. The system of claim 17, wherein the program instructions further include modifying the user profile information based on the user participation information.

20. The system of claim 17, wherein the program instructions further include:
   - monitoring user interaction with the behavior modification tools; and
   - searching the database based on the user interaction information.

21. The system of claim 17, wherein the program instructions for searching a database comprises program instructions for searching an Internet source for the information.

22. The system of claim 17, wherein the information aids the user in complying with the behavior modification program.

23. The system of claim 17, wherein the information is advertisement information.

24. The system of claim 17, wherein the information is news information.
FIG. 2

EXPERT SYSTEM

30

ASK USER PROFILE QUESTIONS

34

ASSESS HEALTH, DIET AND PSYCHOLOGICAL RISKS

36

CREATE PERSONALIZED BEHAVIOR MODIFICATION PROGRAM

38

DETERMINE BEHAVIOR PATTERNS; PROCESS FEEDBACK

40

GATHER INFORMATION/SEARCH DATABASE

42

INTELLIGENT AGENT

32

FILTER/SORT INFORMATION

44

INTEGRATE W/ ON-LINE BEHAVIOR MODIFICATION SYSTEM

46

INTERNET

INTRANET

DEPRECATED DATABASE

OTHER SOURCES OF INFORMATION

APPPOINTMENTS

PRODUCTS

ADVERTISEMENTS

RECIPES

ARTICLES

CHAT GROUPS

OTHER INFORMATION

ALTER ON-LINE JOURNAL

LIFESTYLES TODAY HOME PAGE

SPONSORSHIP

INTERACTIVE KITCHEN

ON-LINE LIBRARY

STRESS MANAGEMENT TOOLS

OTHER BEHAVIOR MODIFICATION TOOLS

AND RESOURCES
<table>
<thead>
<tr>
<th>Personal Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>184 : Smith, Fred</strong></td>
</tr>
<tr>
<td>Please note that all fields noted with an asterisk are required:</td>
</tr>
<tr>
<td>User ID *</td>
</tr>
<tr>
<td>User Password *</td>
</tr>
<tr>
<td>First Name *</td>
</tr>
<tr>
<td>Middle Initial</td>
</tr>
<tr>
<td>Last Name *</td>
</tr>
<tr>
<td>Mother's Maiden Name</td>
</tr>
<tr>
<td>Sex *</td>
</tr>
<tr>
<td>Date of Birth *</td>
</tr>
<tr>
<td>Social Security # *</td>
</tr>
<tr>
<td>Home Address 1 *</td>
</tr>
<tr>
<td>Home Address 2</td>
</tr>
<tr>
<td>City *</td>
</tr>
<tr>
<td>State *</td>
</tr>
<tr>
<td>Zip *</td>
</tr>
<tr>
<td>Home Phone *</td>
</tr>
</tbody>
</table>
**Medical Profile**

184 : Smith, Fred

Please note that all fields indicated by an asterisk must be filled out.

- **Height** *: 70 inches
- **Goal Weight**: 185 lbs
- **Waist** *: 40 inches
- **Waist to Hip Ratio**: 0.94
- **Body Mass Index (BMI)**: 75 BMI
- **Resting Heart Rate** *: 85 bpm
- **Blood Pressure** *: 180 systolic / 100 diastolic
- **Blood Type**: O-

If other, please specify

- **Are you a smoker?** *
  - ☐ No  ☑ Yes

- **Glucose (via finger stick after fasting for 12 hours)** *
  - 140

**Lipid Profile (via finger stick after fasting for 12 hours)**

- **Cholesterol - HDL**: 35
- **Cholesterol - LDL**: 210
- **Ratio**: 6.00 to 1
- **Total Cholesterol**: 260
- **Triglycerides**: 305
Additional Medical Information: Medication
184: Smith, Fred

Medication Type: Prescribed
Medication Name: Norvasc

Dosage: 10 mg
Dosage to:

Prescription number: AH12-67
Pharmacy Phone: 81 - 999 - 9676

Refills: 0
Frequency:
- Daily
- Twice/daily
- Three times/daily

Reminder Service: 2010
Pager Carrier: SkyTel
Pager Number: 818 - 341 - 8898
Frequency time: 11 AM

Other Information:
- Personal
- Medical
- Medical Contact
- Medication
- Surgery
- Additional Medical
- Dietary & Exercise
- Alcohol Consumption
- Stress
- Family, Social, Religious
- Sexuality
- Goal
- Salus Only

Fig. 5
**Goals**

**Fred Smith**  (184)

**Information**
- Personal
- Medical
- Medical Contact
- Medication
- Surgery
- Additional Medical
- Dietary & Exercise
- Alcohol Consumption
- Stress
- Family, Social, Religious
- Sexuality

**Search For User**
- SalusID
- Last Name
- SSN

**View All Users**

**Add New User**

**2016**

How interested are you in making lifestyle changes in each of the following areas?

- Exercise
- Losing weight
- Quitting smoking
- Managing stress
- Changing my diet
- Improving my Relationships with Others
- Managing Alcohol/drug use

Very | Moderately | Somewhat | Not very | Not at all
---|------------|----------|----------|----------
☐   | ☐          | ☒        | ☒        | ☒        | ☒

**2014**

**2018**

**Update**
Vital Statistics
Please select the items that you would like Fred to track in his journal and how often you would like him to track these statistics.

<table>
<thead>
<tr>
<th>Item</th>
<th>Tracking Start Date</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Aug 1 1998</td>
<td>Once a week</td>
</tr>
<tr>
<td>Body Fat</td>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>Waist</td>
<td>Every 30 days</td>
<td></td>
</tr>
<tr>
<td>Hip</td>
<td>Every 30 days</td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>Once A day</td>
<td></td>
</tr>
<tr>
<td>Resting Heart Rate</td>
<td>Once A day</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Every 90 days</td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td>not applicable</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 7
<table>
<thead>
<tr>
<th>Exercise</th>
<th>Weight</th>
<th>Repetitions</th>
<th>Weight</th>
<th>Repetitions</th>
<th>Weight</th>
<th>Repetitions</th>
<th>Weight</th>
<th>Repetitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biceps Curls</td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
</tr>
<tr>
<td>Biceps Curls w/ weights</td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
</tr>
<tr>
<td>Abdominal Work</td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
</tr>
<tr>
<td>Shoulder Curl-Up</td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
</tr>
<tr>
<td>Straight Arm Curl-Ups</td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
</tr>
<tr>
<td>Full Curl-Ups</td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
<td>lbs</td>
<td></td>
</tr>
</tbody>
</table>

*Fig. 8*
Nutrition program: Level 1

Please Review and Confirm

- Start date: 02/04/99
- Goal: Weight Control
- Calories: 2042
- Total Fat: 30% of calories or less
- 68 grams from fat
- Saturated Fat: 10% of calories
- 22.69 grams from saturated fat
- Cholesterol: Less than 300 mg.
- Sodium: 2400 mg.
- Fiber: 20 - 35 grams

Modify

Finish
Health in the News
TV violence impairs memory of commercials
NEW YORK, Dec 07 (Reuters Health) -- TV viewers are less likely to remember commercials that are during violent programs than advertisements that run during non-vio ...

○ Unique cancer pattern among Native Americans
○ Fertility drugs not tied to ovarian cancer

What's Happening at GTE
What the Merger means to you
GTE is joining forces with Bell Atlantic. Read our special Employee Strategy Paper for an idea of what lies ahead. Full Story
○ Employee Assistance Package Center

World News
Personalize Your News Page
Click here to view your current settings, change the layout of your homepage, add or delete content from your home page, or return to the default settings. Click here

○ Top Stories
○ National News
○ International News
○ Business News

Shopping | Stocks | Education
Sports | Travel | Horoscope

Comedy Corner

Fig. 10