

SYSTEM, METHOD AND MEDIUM FOR MINING AND MANAGING USER DATA

Cross-References to Related Applications

[0001] This application claims the benefit, under 35 U.S.C. § 119(e), of U.S. Nonprovisional Patent Application No. 14/252,384 filed on April 14, 2014, which is hereby incorporated by reference in its entirety.

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Technical Field

[0003] The present invention relates to systems, methods and media for the input, processing and output of data, and more specifically, the input, processing and output, including the mining and management, of data that is generated as a result of events that can be attributed to a particular user.

Background

[0004] Recent technological advancements have given rise to solutions for monitoring events occurring around categories of human life activities that may comprise, for example, work and social habits, specific medical conditions, and/or general wellness (i.e. monitoring solutions). Amidst rising healthcare costs, studies suggest that an incrementally less active and more disease-prone population would benefit from the regular use of monitoring solutions, all of which, presently, have failed to garner widespread adoption (“Data & Statistics,” *Centers for Disease Control and Prevention*, 2014). The factors inhibiting widespread adoption of present-day monitoring solutions are examined more fully herein.

[0005] One such factor arises from the prevailing reality that, in general, the monitoring solutions of today are accessed through either a desktop computer or a smart phone interface. Where these circumstances are present, and so being limited by the hardware configurations typical of a desktop computer or smart phone, a user is often required to interrupt their activities, focus their attention upon a display screen and either manually or verbally interact with the elements displayed through the interface. On these occasions, the user is inhibited by the inability to record their behaviors without temporarily diverting their attention. This limitation becomes even more apparent when a user lacks immediate physical access to the computer hardware. If unwilling or unable to bear the inconvenience required to physically access the hardware, the user forfeits opportunities to capture potentially valuable data.

[0006] Further hindering usability is the inability to aggregate and analyze user data originating from a plurality of independently-developed monitoring solutions. Because no single solution monitors every area of life while utilizing every monitoring method that may be desired, a user of multiple solutions will likely amass user data from one solution that logically correlates to user data amassed from another solution. For example, data describing sleep patterns originating from a sleep monitoring solution may correlate to data describing work productivity originating from a work monitoring solution. Considering the potential value of these correlations, a user of multiple independently-developed monitoring solutions might be persuaded to perform their own ad-hoc analysis. Constrained by the user’s limited time, abilities, and other scarce resources, this onerous analytical process is not likely to produce reliable results worth the effort to most.

[0007] Along with the enhanced ability to collect and distribute data arise even more sobering implications toward user privacy. Rather than harnessing the value of the user's participation to develop a system that rewards the user for their efforts, the monitoring solution provider often will instead search for ways to monetize this value in order to finance the provider's own business expenses. For example, many of the monitoring solutions of today limit the user's control over the use of their own data; especially where the provider's monetization strategy involves the distribution of user data to third-parties. The processes by which the user is connected with external parties, including other users and, in some cases, the business partners of the provider, may present as opportunities for hackers to intercept data flowing to and from the mainframe.

[0008] While it may be possible to make these backend processes more secure, the for-profit provider is ultimately responsible for, and maintains discretion in, applying the appropriate controls. Under these circumstances, the user's involvement starts and ends with the provider's ability and incentive to sustain a profitable business, which could implicate the loss of all of the user's data that is stored within the provider's servers. This type of provider neglects those who occupy lower-income brackets, suffer from the most health problems and lead the busiest of lifestyles, who, because of their elevated health needs, are the most likely to benefit from a monitoring solution, and yet, because of the scarcity of their resources, can least afford the risk-reward milieu proposed under such a system.

[0009] Considering all of the above, the success of implementing a monitoring solution may positively correlate to the incorporation of effective methods for automated monitoring as well as analyzing sets of user data originating from independently-developed solutions with respect to each other. Furthermore, the monitoring solution should be made available to the public by an organization whose overriding values are altruistic to prevent misuse of user data. Until these hypothetical requirements are met, it may be too little, too late before the public sees a monitoring solution gain widespread acceptance.

Summary

[0010] An object of the present invention is to overcome drawbacks relating to the compromises in designs of prior art as described above. Consider the need for a user interface

that is suited for either “conscious” or “passive” input. While minimizing the quantity of inputs obfuscates any perceivable advantage of passive input over conscious input, in most instances, monitoring a life area provides opportunities for possibly several minutes and dozens of inputs within a short span, or even near-continuous inputting.

[0011] Invariably, conscious inputting would interrupt this stream of data-capturing opportunities occurring in the course of a user’s normal life activities. Unencumbered inputting would, then, be much more advantageous and could be accomplished through the incorporation of sensors for actively detecting changes within the user’s body and/or environment. Meanwhile, conscious inputting would still enable the user to, when desired, better control the content of the inputs. Ways to seamlessly bridge the gap between conscious and passive use are hence addressed, so that one single solution would suit both functionalities properly.

[0012] The most straightforward approach – and also the most resource intensive – calls for a solution wherein all of the processes ascribed to the present invention are enabled through a single computer program that a user installs and runs. Granted, each user’s interests (e.g. monitoring one life area vs. many) and hardware capabilities (e.g. a basic desktop computer with mouse vs. eyewear incorporating heads-up display) may vary substantially from another user’s, the developer of the solution might attempt to develop a single computer program that satisfies the greatest-need scenarios; scenarios which might be characterized by user demand for coverage of the widest range of complex life areas utilizing the most limited hardware configurations.

[0013] Another approach calls for a plurality of “modules” each comprising processes that could be installed and run separately (i.e. stand-alone) in an effective manner. These modules could also be configured to exchange data with and interact with other modules in order to activate the processes that require the involvement of a plurality of modules. In this alternative approach, a user desiring some, but not all, of the processes ascribed to the present invention, could install and run only some modules. Additionally, a user desiring all of the processes ascribed to the present invention could, alternately, install all modules and, avail to her or his self, the benefits of the earlier-described single-program approach. These modules may be initially developed and configured, either, with cross-compatibility in mind or without consideration of the other modules.

[0014] In the latter instance, these independently-developed solutions would be modified

in order to synchronize with other modules through the installation of plug-ins. For instance, where a plurality of modules responsible for monitoring separate life areas is involved, the installation of plug-ins for the independently-developed solutions could enable transmission of relevant user data into a “mining module” that aggregates and correlates the individual sets of data with respect to one another in order to generate feedback on a single client-side interface. While educating usability and compatibility concerns, if executed properly, this method would address concerns about the ability for a single service provider to develop all of the processes ascribed to the present invention.

[0015] Connection with a mining module would, further, likely have the effect of increasing the functionality of the independent service providers’ respective monitoring solutions by introducing previously unattainable data derived from other monitoring solutions in the analysis and feedback process. In order to incentivize independent service providers, the developer of the mining module might aim to help defray the costs of integrating independently-developed solutions into the “core”. Thus, the plug-in to be installed with the independently-developed solutions might confer additional processes that a service provider could benefit from; processes which would either be built around the service provider’s preexisting solution and/or replace aspects of the development process that the service provider would have been required to perform itself in creating and/or updating its solution.

[0016] Iterated in any form or fashion, the monitoring aspect of the present invention seeks to address user concerns over service continuity, information privacy, and the opportunity costs associated with participation. Presently, a user of a monitoring solution might face upfront charges, unwanted ads, and the sale of personal information to external, unrelated parties. These practices contradict a user’s interests with respect to monitoring and managing her or his personal life. Empowering the user to control the nature and extent of, not only information sharing, but also, through multi-tiered encryption and multi-factor access controls, any data transmissions involving the solution would, in effect, confront this dilemma. Provided, the act of information-sharing introduces the potential for a value exchange with an external party, the present invention also provides for a means to translate that value into a reward for the user.

[0017] Where user data is valued by a medical researcher for fulfilling the requirements of a study, she or he might be provided with a means for creating an appeal, by which a potential

research subject could view the study requirements and enroll anonymously. In exchange for her or his participation, the subject may require that certain conditions be met by the researcher; conditions which could include compensating the subject. Converting the normally one-sided process of study recruitment and fulfillment into a two-way value exchange could provide citizens with a greater incentive to enhance their lives with a monitoring solution; citizens who in turn could provide a much-needed boost to the medical community and society at large by taking a more proactive role in preventive health care, with the opportunity to further life-saving medical research along the way

[0018] These and other aspects are described more fully herein with references to accompanying illustrations of various embodiments of the invention, and are not limited to the embodiments set forth herein. Identical reference numerals to elements in the description do not imply that the said elements are identical.

Brief Description of Drawings

[0019] FIG. 1A is a data flow diagram depicting monitoring and feedback in accordance with some embodiments of the present invention.

[0020] FIG. 1B is a system flow diagram depicting data processing in accordance with some embodiments of the present invention.

[0021] FIG. 1C is a system context diagram depicting relationships between various physical and logical aspects of the system in accordance with some embodiments of the present invention.

[0022] FIG. 2 is a process flow chart depicting navigation of the user interface in accordance with some embodiments of the present invention.

[0023] FIG. 3 is a diagram depicting the flow of data between the mining module and external parties in accordance with some embodiments of the present invention.

[0024] FIG. 4 is a diagram depicting the authentication process for the enrollment of research subjects in accordance with some embodiments of the present invention.

[0025] FIG. 5A is an illustration depicting various client computers and sensory devices

in accordance with some embodiments of the present invention.

[0026] FIG. 5B is an illustration depicting various client computer interfaces in accordance with some embodiments of the present invention.

Detailed Description

[0027] With reference to FIGS. 1C and 2 depicting, respectively and in accordance with some embodiments of the present invention, first, relationships between various physical and logical aspects of the system and, second, navigation of the user interface 103; the present invention may incorporate a “client system” practiced by a “user”. The client system comprises one or more “modules 100” that, may or may not be augmented by one or more “plug-ins”; (103 modules 100 and plug-ins, both, of which, incorporate physical and logical elements for the input, processing and/or output of data.

[0028] Since, without clarification, “modules 100” and “plug-ins”, each, might otherwise be depicted as “elements” and, more explicitly, as “processes”, in and of themselves; for the purpose of describing the client system, all of the various types of modules 100 and plug-ins are distinguished from all of the other processes ascribed to the client system, and hereafter referred to, collectively, as, “approaches” for practicing the said processes. Being limited by the various approaches practiced, a particular embodiment of the client system may or may not incorporate all of the processes that are ascribed to the client system.

[0029] A single “module 100” comprises processes that could be installed and run separately (i.e. stand alone) in an effective manner. A plurality of modules 100 could also be configured to exchange data with and interact with other modules 100 (i.e. integrate) in order to activate the processes that require the involvement of a plurality of modules 100. Granted, the client system could consist of a single module 100, which the user installs and runs altogether; or, a plurality of modules 100 which may be installed and run separately from other modules 100 and/or configured to integrate with other modules 100; a user desiring some, but not all, of the processes ascribed to the client system, could install and run only some modules 100, whereas a user desiring all processes could install all modules 100. The client system can therefore be thought of as, at one extreme, a plurality of modules 100 that, each, comprise an individual process or, at another extreme, as one single module 100 that comprises all of the processes, which are ascribed to the client system.

[0030] A “plug-in” comprises additional processes that could be installed and run alongside existing processes (i.e. concomitantly) in order to augment the functionality of the existing processes, themselves. Where these existing processes comprise processes ascribed to

the client system, they are referred to as modules **100**, which are augmented with additional processes by the installation of a “plug-in”. Where these existing processes are installed and run separately from other modules **100** and do not comprise processes ascribed to the client system, they are not referred to as modules **100** but, upon the installation of a “plug-in” that enables processes ascribed to the client system, are referred to as modules **100**.

[0031] In any approach involving the implementation of a plurality of modules **100**, and where limitations exist in the design and implementation of the processes that enable data exchange and interaction between modules **100**; or in other words, where two separate modules **100** are not developed and configured with cross-compatibility in mind (i.e. independently-developed solutions), a plug-in, comprising the processes of one module **100**, could, instead, be installed to the other module **100**, and thereby enable the said processes that enable data exchange and interaction between modules **100**.

[0032] More specifically, the processes that might have been possible had the two modules **100** been developed with cross-compatibility in mind, would be enabled through the installation of a plug-in to an existing module **100**, and running the existing module **100** with the plug-in installed. For example, a type of plug-in designed to establish a desired level of cross-compatibility between modules **100** may be installed in order to enable the two modules **100** to share the same data as if they had been initially designed to be cross-compatible.

[0033] With reference to FIGS. 5A and 5B depicting, respectively and in accordance with some embodiments of the present invention, various client devices, the client system may be installed and activated (i.e. “run”) from a “client device” **500** that is a medium incorporating physical elements for the input, processing and/or output of data. The client device may be practiced by any suitable device for practicing an aspect or aspects of the present invention incorporating inputting, processing and/or outputting elements.

[0034] The client device may comprise certain inputting elements that enable the user to interact with the client system “consciously” **101** and “passively” **102**. Conscious input **101**, depending upon the client system configuration, may result from a user’s deliberate interaction with the client device by which the same user intends to transfer logic flowing from her or his consciousness unto the client system. Passive input **102**, depending upon the client system configuration, may result from a client device that has the ability to detect changes within the

user's body and/or environment, and is configured to transfer such detections to the client system.

[0035] The client device may further comprise certain processing elements that, in order to prepare the data for outputting, convert the inputted data into a different format, and may further comprise certain elements for the output of the said data. Examples of client devices relied upon for inputting of data (hereafter referred to simply as inputting) may include a voice recorder, a touch pad, a mouse, a keyboard, a pulse gauge, an electroencephalogram, and a glucometer **514**. Examples of client devices relied upon for outputting of data (hereafter referred to simply as outputting) may include a workstation display **501**, a smart phone display, a smart watch, and a heads-up display.

[0036] The voice recorder, touch pad, mouse, keyboard, workstation display **501** and smart phone display also typify client devices relied upon primarily for inputting and/or outputting (i.e. input devices; output devices) wherein a physical connection with the client device relied upon primarily for processing (i.e. processing device) is visibly apparent. The physical connection is apparent in such input and output devices' wired connection to such a processing device.

[0037] Whenever a visibly-apparent physical connection exists between, a client device relied upon primarily for inputting and/or outputting and, a client device relied upon primarily for processing, such inputting and outputting devices may be considered as one with such a processing device. Hence, if such a processing device is called a computer, such inputting and outputting devices may be understood to be encompassed within the use of the same term, and may additionally be referred to as "built-in" devices.

[0038] The pulse gauge, electroencephalogram, glucometer **514**, smart watch and heads-up display also typify client devices relied upon primarily for inputting and/or outputting wherein a physical connection with the client device relied upon primarily for processing is not visibly apparent. The physical connection is not apparent in such input and output devices' lack of a wired connection to such a processing device, assuming that the smart watch and heads-up displays are used as display devices for a separate processing device (e.g. a smart phone) that is connected wirelessly.

[0039] Whenever a visibly-apparent physical connection does not exist between, a client

device relied upon primarily for inputting and/or outputting and, a client device relied upon for processing, such inputting and outputting devices may be distinguished from such a processing element by being referred to individually by their respective designations (e.g. pulse gauge; glucometer 514) or may also be referred to, collectively, as “add-on” devices.

[0040] Because a client device, encompassing all of the same processes, may vary slightly in the relative physical arrangement of the hardware that enables the said processes without impinging upon the utility of the present invention, each of the elements described herein encompassing an aspect or aspects of the client device such as data inputting, processing and outputting, may be physically rearranged so that all of the processes are, either, encompassed within a single element (e.g. a computer), or are encompassed amongst a plurality of elements.

[0041] Owing to the ability to physically rearrange certain aspects of the client device that are immaterial to the utility of the present invention, within various embodiments, the term “client device” may encompass the elements relied upon for data inputting, processing and/or outputting by the user, regardless of whether or not a physical connection between any of these elements is visibly apparent.

[0042] In one scenario, the device relied upon primarily for outputting may not bear an apparent physical connection to the devices that are relied upon primarily for inputting and processing in practicing the present invention, yet each of these elements may be understood to be encompassed within the use of the term, client device. This scenario may be demonstrated by a client device configuration incorporating a display device that is worn on or about the user’s body (e.g. a heads-up display) and displays graphical elements that are transmitted from a smart phone that is connected to the same display device wirelessly.

[0043] In another scenario, the device relied upon primarily for outputting may indeed bear an apparent physical connection to the devices that are relied upon primarily for inputting and processing in practicing the present invention, and each of these elements may be understood to be encompassed within the use of the term, client device. This scenario may be demonstrated by a client device configuration incorporating a display device that is worn on or about the user’s body that, within the same physical hardware that encapsulates the said display device, is incorporated the same or similar input and/or processing processes embodied within the smart phone device in the previous example.

[0044] Furthermore, both of the aforementioned scenarios may be demonstrated by a client device configuration incorporating, within the physical hardware of, both, the display device that is worn on or about the user's body, and the smart phone device, input, processing and/or display processes, which may be connected wirelessly so that either device may be used for inputting and displaying elements that are processed by the other device at any time, depending upon the user's preferences. Because of the plurality of possible combinations of devices that can be used primarily for inputting, processing and outputting, each of these combinations is understood to exist as a separate client device configuration.

[0045] Because the processing device in a given embodiment of the present invention may incorporate a type of computer, yet not being limited by the term "computer" in other embodiments, the processing device in any client device configuration, as well as any inputting and outputting elements bearing a visibly-apparent physical connection (i.e. built-in) to the processing device, are referred to in the embodiment described herein, collectively, as the client computer, with any additional inputting and outputting devices within a single client device configuration not bearing a visibly-apparent physical connection (i.e. added-on) to the processing device, being referred to, individually by their discrete designations or, collectively, as add-on devices.

[0046] In the embodiment described herein, the client computer exists in the form of an electronic medium that incorporates elements for processing data and, depending upon its configuration, may also incorporate elements for inputting and outputting data. A client computer may also incorporate elements for storing data, as well as transmitting data through a communication protocol (e.g. the Internet).

[0047] With reference to FIG. 5A depicting components of various client device configurations in accordance with some embodiments of the present invention; depending upon the type of client computer being utilized by the user, interactions with the client system's graphical interface 103, such as, for example, those described above, may differ. In some instances, the display may be connected to the client computer externally through a video connector, as might be the situation where the client computer is a workstation computer, or alternately, a television set-top box that connects to the Internet via the user's cable or satellite receiver 506, with the television screen serving as the computer display. In other instances, the

display may also be built into the housing of the device **502**.

[0048] A “display” may describe any device that is capable of producing a visual representation of data (e.g. Cathode-Ray Tube “CRT”; Liquid Crystal Display “LCD”; Light-Emitting Diode “LED”). Interaction with the interface **103**, or conscious input **101**, is comprised of the user actions of text input (e.g. adding text to a text box) or selection-making (e.g. selecting a response from a list of options), and is achieved through a plurality of commands performed by the user depending upon the device's built-in and add-on capabilities.

[0049] Some examples of methods for user interaction with the graphical interface **103** displayed upon the client computer may include: Depressing a key or button upon a keypad device or remote control, which may activate a certain command that corresponds to a particular button or key **512**; Moving a pointer device, the movements of which correspond to an overlaid pointer visible from the client system interface **103** (i.e. a cursor) that, when aligned with an on-screen element and combined with an action such as the depressing of a key or button, may activate a certain command (e.g. “selecting” or, choosing the said element, by which the element may become the focus of any subsequent interactions with the interface **103**); Tapping or touching an area on the surface of a touch-sensitive display **502** **510**, which may activate a certain command that corresponds to a particular area on the surface of the touch-sensitive display.

[0050] Some further examples of methods for user communication with the graphical interface **103** displayed upon the client computer may include: Controlling the onscreen cursor with hand gestures through an electronic medium worn over the hands that incorporates gyroscopes **511**; Verbalizing a sound into a microphone sensor, which may activate a certain command that corresponds to a particular aural pattern, through the conversion of audio captures into data by aural sensors on the microphone and audio recognition software that maps the data to the closest recognized patterns; Displaying an object or performing an action in the view of a visual sensor such as the pointing **509**, **501** or blinking of the eye **504** **503** **505** which may activate a certain command that corresponds to a particular visual pattern, through the conversion of video captures into data by visual sensors on the camera and visual pattern-recognition software that maps the data to the closest recognized patterns.

[0051] With reference to FIG. 5B depicting various client computer interfaces **103** in

accordance with some embodiments of the present invention; user interaction with the graphical interface **103** may differ according to the type of client computer used to run the client system. For the purpose of describing these differences, a “content grouping” hereafter refers to all of the content displayed on a graphical interface **103** that a user might normally expect to find organized on a single display page being viewed from a desktop computer configuration (i.e. “large-screen configuration”) **112**. Examples of a content grouping may include a user registration page **201**, or a page for completing a manual input. A “page” may refer to all of the content that may be generated through a graphical interface **103** to be displayed on a display screen at one time.

[0052] For the purpose of differentiating various client computer configurations, a client computer that is being identified by its physical composition and the method most commonly prescribed for its use, may hereafter be referred to as a: “workstation” **113, 501**, for a “large screen” client computer configuration (e.g. a personal computer; Internet television), and “handheld mobile” **114, 502** or “hands-free mobile” **112, 503** or, more generally, as “mobile”, for a “small screen” client computer configuration. Relating to the concept of content groupings, the client system will typically follow an expected format depending upon the type of client computer configuration that is employed. Generally, if the client system is running on a workstation device, an entire content grouping may be displayed on a single page that can be viewed by scrolling a vertical scrollbar up and down the contents of the page, and with user input achieved by adding text to a text box or selecting a response from a menu.

[0053] Generally, if the client system is running on a mobile computer, a single content grouping may either be displayed in a smaller font size than what might normally appear on a workstation device relative to the same content grouping, or the content grouping may be divided and distributed amongst multiple display pages. The client system running on a handheld mobile client computer might display one or a few lines from a content grouping on single display page **502** to accommodate the smaller screen size, with user input achieved by adding text to a text box or selecting a response from a set of options, and navigation achieved by toggling the “next” and “back” options at the bottom of the page if the content grouping is dispersed over multiple display pages.

[0054] The precise orientation of content groupings will vary according to the built-in

capabilities of the device that is being used to run the client system. A type of hands-free mobile computer may be capable of overlaying a graphical interface **103** over a visual representation of the user's visual field that is generated through a visual sensor directed at the user's visual field (i.e. "augmented reality"). Through the graphical interface **103** overlay, aspects of the user's visual field may be highlighted by content markers generated in real-time as opportunities to provide relevant content are recognized through detection of visual patterns in the user's visual field by pattern-recognition software. This graphical interface **103** may be displayed through a medium that intersects some portion of the user's natural visual field, which may be worn on the user's body i.e. heads-up display.

[0055] The client system running on a hands-free mobile computer with a display only large enough to display one line from a full content grouping at a time might achieve user input by verbalizing text into a text box or by selecting from a set of options that may appear at the edge of the user's line of vision **503**. Examples of options that might be displayed to a user on the graphical interface **103** of a hands-free computer might be designated for toggling "more content" in order to view more lines of the content grouping, "previous content" to view the previously displayed lines of content, "more options" to view options that are not displayed on screen at the time, and/or "previous options" to view the previously displayed options.

[0056] When the device for displaying the graphical interface **103** generated by the client computer is capable of sensing the movement of the user's pupils and eyelids through a visual sensor such as a webcam **509** or a motion sensor, e.g. a hands-free mobile device incorporating a projection medium and user-facing visual sensor, which are positioned in front of the user's eyes and rest upon the bridge of the user's nose **505** or rest directly upon the cornea of the user's eyes **503**, if more than one selection is possible for a particular input field on the graphical interface **103**, the user may perform a blinking action (i.e. rapidly closing together and subsequently re-opening the eye lids) once while looking in the direction of an option to select the particular option, and once again in the direction of the selected option to deselect the particular option. Thus, in this example, the graphical interface **103** incorporates a visual representation of the user's field of vision, which encompasses all visually-discriminable objects within the user's field of vision.

[0057] As in the example wherein a cursor that is visible from the client system interface

103 may be manipulated by an input device in order to “select” an element(s) to become the focus of subsequent interactions with the interface **103** through the input device, a user with such functionality enabled as that provided by the device described within the previous paragraph may enable a user to select an element by directing her or his line of vision at the item (i.e. looking).

[0058] The user’s line of vision might be detected by the pupil-facing sensor and mapped to the representation of the user’s visual field produced by the visual sensor pointed at the user’s field of vision. By this, the user would be able to direct commands at this item (e.g. looking at a product in a store and saying, “Remember the price of this”), which the client system would recognize through the audio recognition software and store the related data amongst the user’s data which could then be later recalled as desired by the user.

[0059] Because the user’s line of vision might capture more than one item, a sort of cursor might center in on a particular item in the user’s line of vision when it is selected. The user might then be able to toggle this cursor to another item in the user’s line of vision by performing a pre-defined action, such as blinking in the same direction, or verbalizing a command such as, “Next item,”, which would cause the cursor to center in on another item in the user’s field of vision. The user could repeat this action until the cursor is centered on the item that the user desires to be the focus of subsequent commands.

[0060] While various client computer configurations may still incorporate many or all of the same processes as their counterparts, the execution of processes may vary depending upon the type of client computer that is being used at the time and the manner in which the constituent actions for executing the certain process are performed on various client computers. When the said execution of a certain process involves “dragging and dropping” movable elements, the constituent actions performed usually involve selecting, dragging and dropping the desired elements. Depending upon the type of client computer, these constituent actions may involve a mouse that is moved and clicked, a touch-sensitive screen **502 510** that is swiped and tapped **502 510**, or a sensor directed at the user’s pupil that senses the user’s line of vision and movement of the user’s eyelids.

[0061] Thus, on a workstation computer, dragging and dropping may be as simple as moving a cursor over the visual representations of, and double-clicking, the movable elements (such as files) with a mouse, holding the second click, and “dragging and dropping” the said

elements in the desired location. Similarly, on a handheld mobile computer, the process may be executed in the same manner by tapping a touch-sensitive screen **502 510** instead of clicking on a mouse pad.

[0062] On a hands-free mobile computer incorporating a sensor that is capable of detecting movements of the user's pupil, the process may be executed in the same manner by, rather than moving a cursor with a mouse and tapping or clicking, instead, looking and, at the same time, wincing in the direction of the movable elements that the user desires to move. While wincing, the user may direct his line of vision to the location to which she or he desires the elements to be moved.

[0063] Alternately, where voice recognition software is enabled through the client computer, the user may also perform a certain voice command in order to move the files from one location to another, such as looking in the direction of the said items, voicing a command corresponding to an action to copy the elements, such as "drag", looking in the direction of the desired location, and voicing a command corresponding to an action to move the elements to the desired location, such as "drop".

[0064] Data involved in the inputting, processing and outputting processes may be described as client system data, processing data or user data. In order to distinguish the location of the related data, client system data is said to reside on a client system database **104**, processing data is said to reside on a processing database and user data is said to reside on a user database **106**.

[0065] A type of data, that is generated as a result of events that can be attributed to a particular user, is referred to as, "user data". The process of attribution involves interpreting the data in a manner by which the event(s) that resulted in the generation of the said data may be attributed to a particular user (e.g. by a username or anonymous key). Client system data and processing data consist primarily of the programming elements involved in the inputting, processing and outputting processes that are generally not attributed to a particular user.

[0066] The client system may be compatible to run on a plurality of Internet-enabled client computers that utilize different operating systems **113 114 115** through the shared access of the same variable data **106 116** and the programming of the same or similar logical functionalities **201 202** into separate client system databases **104**; client system databases **104**,

which may be configured to run the client system through various operating systems and/or web browsers **112**.

[0067] Because the client system may comprise, either, a single or a plurality of modules **100**, each of which may comprise a unique user interface **103**, executable, and/or application database(s) or may, alternately, share some aspects of these elements, client system interface **103** hereafter refers to the totality of user interfaces **103** embodied by the modules **100**, and client system database **104** hereafter refers to the totality of application databases embodied by the modules **100**.

[0068] This client system may, when run from a client computer, generate a graphical interface **103** that is displayed to the user upon a display connected to the client computer. The interface **103** is generated from the client system's programming code that resides on the client system database **104**. Unless the user is running the client system through a web browser **112** installed on a computer, the user runs the client system from the client computer operating system **113 114 115**, and the client system database **104** resides in the client computer's memory storage. In this instance, the client system, in order to run, does not require a connection to the Internet because the client system's programming code is stored locally (i.e. on the client-side).

[0069] When the user is running the client system from the client computer operating system **113 114 115** instead of a web browser **112**, a different client computer operating system **113 114 115** might require a different client system database **104** to generate a unique interface **103**, such that the user would be required to download the appropriate operating system-specific version of the client system in order for the client system to run properly on the client computer. In the event that the client system is being run from a web browser **112**, the client system database **104** is understood to reside on the mainframe computer in the form of a web app database(s) **111**.

[0070] Any of the processes ascribed to the client system which, depending upon the location of the related data and databases, may be described as residing on the mainframe computer (or, alternately, the client computer) in certain paragraphs, and may also be described as residing on the client computer (or, alternately, the mainframe computer) in certain other paragraphs describing various configurations of the same or different embodiments of the client system. In other words, where elements residing on the client computer may be referred to as

client-side, or local, elements, and elements residing on the mainframe may be referred to as mainframe, or remote, elements, an element described in one instance as a client-side element, may be described in another instance as a mainframe element depending upon the configuration of the client system.

[0071] In addition, elements of the client system that may be observed from the graphical user interface **103** generated by the client system and displayed from the client computer may be referred to as front-end elements, while elements of the client system that are not observable from the graphical user interface **103** generated by the client system and displayed from the client computer may be referred to as back-end elements. Generally, front-end elements are not mainframe elements, while back-end elements may be, either, mainframe or client-side elements.

[0072] With reference to FIG. 1B depicting data processing in accordance with some embodiments of the present invention; when the client computer that is running the client system from the client computer operating system **113 114 115** (as opposed to a web browser **112**) is not connected to the Internet, user data that is retrieved by the client system may initially be transmitted to the client-side, where it may be stored in the client system database **104** or some other database that resides in the client computer's memory storage.

[0073] Regardless of the client system version (operating system-based or web-based) that is being run, the user data may be created in an encrypted format (e.g. Secure Socket Layer; 256-bit Advanced Encryption Standard). All user data, including user data and other user inputs, that is stored in the appropriate client system database **104 107, 106** may be transmitted **105** to the user database **106 107**. From the user database **106**, data is transmitted to the client system where it may be incorporated into the content displayed from the client computer.

[0074] When the user database **106** resides on a mainframe computer, the user data may be transmitted over a communication protocol such as the Internet in order to reach the user database **106**. The server that houses the user database **106** may be located in a secure storage facility (which is a facility that may be locked and/or guarded and may employ professional penetration testing performed at regular and/or random intervals to assess the ability of unauthorized persons to access the server). Alternately, remote storage may be achieved by utilizing an Internet-based "cloud server" data storage service.

[0075] In transmitting the data to an external server, the data is encrypted with an

encryption passkey, which the external server is configured to recognize and validate in order to decrypt the data. Either prior to transmitting the data to the external server or upon transmission, the user's personally identifiable information is assigned a generic identification key that corresponds to the user's account.

[0076] In addition to being transmitted to an external server via some data communication protocol, the data stored on the user's client computer may be stored on the user's client computer, where it may, depending upon the user's client computer configuration and client system preferences, not be transmitted to an external server. Where a user chooses to limit user data from being transmitted to a user database **106** residing on a mainframe computer and, thus, all user data is stored locally on the client computer, data only passes through mainframe computers as they are being transmitted from the user to an external party (in the event that the user has chosen to share the particular data with a external party) and/or for processing.

[0077] Likewise, in the event of an arrangement to transmit user data to an external party, or to a processing element of the client system residing on the mainframe, data originating from external parties and/or processed user data **109** may be transmitted from the mainframe back to the user's client computer. In order for a user to share data with another party, the user might follow certain steps, which may vary depending upon the type of party that the user seeks to form a connection with. Also, the basis for a user choosing to share information might vary in accordance with the nature of the party that is the recipient of the said data. The various arrangements for sharing data are described more fully in subsequent paragraphs.

[0078] However, because it may also be possible for user data to be shared with an external party without passing through mainframe computers, the user may configure the client system to apply certain settings to certain user data from being transmitted through certain communication protocols such as the Internet. An alternative to sharing user data through the Internet might be provided in the form of near-field communication, by which the user may transfer the selected files to an external party that has enabled near-field communication on her or his client computer. The selected files would be transferred into the location of the external party's client system whereby the client system would recognize, and consequently avail, to the external party, the functionality provided upon receiving the shared data.

[0079] In addition to user data, the logic needed to process the user data may be downloaded to the client computer and accessed at the local level. This is an example of an element described as, initially, residing on the mainframe, and in another configuration of the same embodiment, residing on the client-side. Thus, it may be possible that user data only pass through mainframe computers as the user data is being shared with an external party.

[0080] In either instance, the localization process, by which all user data may be downloaded directly to the client computer, may also involve the conversion of the raw data into the form of files; a process which is hereafter referred to as “adaptation”. The adapted files may be observed and opened by the user, possibly through the graphical interface **103** of the locally-installed OS-version of the client system **113 114 115**, or through the graphical interface **103** of the operating system’s file storage system, which may include “folders” that are repositories for files as well as other folders (i.e. subfolders).

[0081] The localization process, by which user data is transmitted directly to and stored on the client computer, may exist in the form of a module **100** or plug-in. Thus, as a module **100**, the process might be installed and run on a given client computer separately from other modules **100** and, may also, be configured to integrate with other such modules **100**. As a plug-in, the process might be distributed to independent developers and coded into their solutions comprising various modules **100** in order to avail, to the users of their respective solutions, the functionality provided by localization.

[0082] Adaptation may enable the creation of such files in formats that can be opened by popular file-opening, file-viewing, and/or file-editing computer programs so that the user would be able to open the files, view the contents of the files, and potentially perform certain edits to the files, outside of the client system. In addition, the process may also enable the creation of such files with file names that are descriptive of the contents of the file, and create folders with folder names that are descriptive of the types of files that they will store. These folder names may, in some form, denote the category that the file is classified by. The processes by which files are categorized are discussed in subsequent paragraphs.

[0083] Through adaptation the user might be able to more easily characterize and positively identify the data contained in the file or folder without opening the file or folder, and consequently make the process of rearranging, editing and/or deleting multiple files less

cumbersome than opening each individual file. For example, a single file named “client system config”, which can be opened, viewed and edited, might contain all of the user data pertaining to the configuration of the client system. In addition to its application to localized data, adaptation may exist exclusively of localization e.g. in the event that user data residing on the mainframe is viewed in the form of files.

[0084] In certain instances, it may be necessary to disable the ability to perform certain edits to and/or to delete certain files in order to utilize certain processes of the client system, as might be the situation where certain edits or deletions could corrupt files in a way that could cause the client system to malfunction, or where the user has formally arranged to share certain user data with external parties (further described in subsequent paragraphs).

[0085] Where the client system has been configured to back up files, including user data, and, when an edit or deletion to a file that causes the client system to malfunction has been detected, a prompt may be displayed through the client system to the user describing an option to restore the said file. In the instance where the related data is subject to a formal arrangement, if the client system has been configured to back up the related files, it may display a prompt to the user describing an option to, either, restore the related file, or be required to deliberately and formally consent to the termination of the said arrangement. Such user data that is the focus of a formal arrangement may be transmitted, through the Internet, to a mainframe computer whereby the data may be accessed by the remote external party with whom a formal arrangement had been consented to by the particular user.

[0086] A file may become uneditable upon creation or upon any trigger that causes the file to become uneditable as by, for instance, a formal arrangement with external parties. Where these are the circumstances, the file may be downloaded to a file location and/or in a file format in which the data may not be edited and/or deleted without removing the related computer program. In addition, components of the original uneditable file that could be edited without causing a conflict or malfunction as in the instances described above, may be extracted to an editable file that may allow for editing of certain components of the original uneditable file.

[0087] In the event that the client system is initially configured to download all of the user data to the remote user database **106**, and an arrangement such as the one described in the preceding paragraphs is desired, wherein user data that is created in the future is prevented from

being transmitted to the remote user database **106**; an additional option may be toggled for downloading, to the client computer, all or a portion of the user data that was previously stored remotely. Through the provision of such an option, the user data that had been created in the past and stored on the mainframe might then be aggregated with the user data that is stored and accessed locally.

[0088] In addition, the ability to download to the client computer all user data that had been previously stored on the mainframe, and the ability to directly transmit and store future-generated user data on the client computer, both, provide the user with the ability to transfer or copy, from the client computer, all user data to a removable storage device. The user could, subsequently, transfer or copy their user data from the removable storage device to another computer from which the user data is being stored and access, and/or create back-ups in order to prevent loss of data, for instance, in the event that the computer storing user data is damaged or lost.

[0089] Additionally, the user might install upon and run from a removable storage device certain elements comprising, for example, the client system and/or its various parts such as user data and/or processing data. This removable storage device could subsequently connect to a plurality of separate client computers from which the aforementioned elements, while running from the removable storage device, could be displayed and operated.

[0090] In the situation where only various parts of the client system such as user data or processing data accessed from a removable storage device during the operation of the client system, the client system would be installed on a client computer, and options to upload the user data, and run the processing elements, from a particular location or locations (in this instance, a removable storage device), may be provided to the user. This removable storage device might also be configured to install and run encryption software on the client computer that it is connected to, such that the contents of the removable storage device are not visible through the client computer until the validation requirements of the encryption software have been cleared and, thereby, provide an additional layer of security.

[0091] Where a user that has selected the option to store all user data locally on the user's client computer may desire the ability to transfer files directly from one client computer to another in order to run the client system from more than one client computer, a module **100** or

plug-in may provide the functionality by which the user may connect two or more client computers, and synchronize locally-stored user data either in its entirety or by consciously selecting, through an on-screen interface **103**, the files which the user would like to transfer, and to which client computers.

[0092] Forming a connection over which data can be transmitted to and from various client computers may depend upon the configuration of the client computer. This connection may be formed between two or more client computers using a compatible near-field communication protocol that is built-in to the physical components housing the computer's display, data storage and/or processor; a configuration which may be more typical of handheld and hands-free mobile computers (further described in subsequent paragraphs).

[0093] This connection may also be formed with a client computer utilizing an alternative means of data communication such as a computer bus connector (e.g. Universal Serial Bus), which may be especially useful where the client computer does not have incorporated into its hardware a compatible form of near-field communication as would be the situation with many workstation computers (a computer hardware configuration which is described in subsequent paragraphs), such as desktops.

[0094] In addition to synchronizing locally-stored user data, this connection over which data can be transmitted to and from potential client computers (that are, by definition, computers), might be a means to synchronize graphical interfaces **103** of two or more computers to perform actions involving both computers through the respective computers' graphical displays (a process that is hereafter referred to as "visual synchronization"), such as dragging-and-dropping files. Such a connection might be initiated by either establishing a physical connection between the computer buses of the computers or validating the near-field communication protocol between computers, and running the computer programming (which may be incorporated in the form of a module **100** or plug-in) responsible for the visual-synchronization process, which is described in later paragraphs.

[0095] Where the user is attempting to visually synchronize two or more computer displays using a compatible near-field technology that is built-in to the computers, the position of each computer's display relative to the others (whether to the left or to the right) may be identified using near-field technology itself, such as by determining the angle and distance of the

beam produced by the near-field technology to connect the devices to a particular relative position (left or right).

[0096] Where the user is attempting to visually synchronize to a computer using an alternative means of data communication that does not incorporate near-field technology, such as by physically connecting a computer bus connector between computers, an on-screen option may prompt the user to consciously identify the relative position of the devices. This would be applicable where near-field technology is not incorporated in one or more of the computers attempting to be visually synchronized.

[0097] Another scenario that may require conscious identification of the relative position of the devices is where one or more of the computers being visually synchronized processes a display that is disconnected from the hardware from which such a near-field communication protocol (e.g. infrared; Bluetooth) would be run. This might be the circumstance in a desktop computer with a computer display (e.g. CRT; LCD; LED) that is separate from the hardware physically containing near-field technology, such as a set-top computer casing that does not involve physically displaying the graphical elements.

[0098] Thus, in this scenario, it might be possible that a computer's near-field technology is relatively positioned to the left of, while the same computer's display is relatively positioned to the right of, the separate display to which it is being visually synchronized. In these circumstances, an option to consciously input the user's visual determination of the relative positioning of the displays would be advantageous.

[0099] Alternately, a beaming device that is equipped with near-field communication protocol may be affixed to a computer display and paired with a connector device (e.g. wireless USB) that is physically connected to or "plugged into" the housing of the computer's data storage and processing subcomponents where the near-field technology is likely to reside. The connector receives and converts the said beam into data that describes the angle and distance of the said beam, enabling the determination of relative distance from one physical component of the computer to another. The said data, which describes the relative positioning of the computer's display, is transmitted, through the connector device, to the computer, itself.

[0100] This process, effectually, describes a two-step calculation involving, first, the relative distance of the display to the computer's separate near-field-enabled hardware and,

second, the relative distance of the near-field-enabled hardware to the device to which the computer is being visually synchronized. Such a configuration may be desired where two workstation computers, each with near-field communication built-in to a component of the computer that is physically separate from the computer's display, are being visually-synchronized.

[0101] Another scenario describes visual synchronization between a computer with a separate display (e.g. workstation), and a computer with a built-in display (e.g. mobile). Here, a beaming device may be affixed to the graphical display of, for example, a workstation computer and, may, through near-field communication, be configured to connect directly to, for example, a near-field -enabled mobile computer, enabling the determination of the relative position between the respective computer displays in one step (as opposed to determining the relative position of one physical component of a computer to another, which then, itself, must be connected to computers with which visual synchronization is desired).

[0102] The computer programming responsible for enabling visual synchronization may be incorporated in the form of a module **100** or plug-in. This module **100** or plug-in, which is installed on the computers for which visual synchronization is desired, may comprise programming code that is configured to, in real-time, construct a graphical representation of the graphical elements displayed from each computer and, after the connection between computers has been established, transmit the data comprising the said graphical representation to the module **100** or plug-in running on the other computer.

[0103] Depending upon the particular computer that the user is consciously controlling at a given point in time (in this instance, referred to as the “primary computer”), data relating to the conscious interaction between the user and the graphical interface **103** of the said computer may be transmitted to the module **100** or plug-in running on the particular computer that the user is not consciously interacting with at a given point in time (in this instance, referred to as the “secondary computer”).

[0104] By this, the user may be provided with the ability to, through the primary computer, move a cursor, or perform another action that involves the location of elements on an interface **103** such as dragging a set of files that have been designated as “copied”, in the direction of the display screen of the secondary computer and, by this action, cause the cursor or

copied files to move off of the screen of the primary computer and onto the screen of the secondary computer.

[0105] By this the user may then be able to, from the primary computer, consciously interact with and perform various tasks on the interface **103** viewable from the secondary computer configuration, including controlling a cursor visible on the secondary computer's display, and/or dropping files dragged from the primary computer into a folder visible on the secondary computer's display. The process of "dragging and dropping files" may differ depending upon the manner by which the process is executed and the type of primary computer that is being used at the time. The various manners by which dragging-and-dropping is performed, specific to each type of client computer, are described in subsequent paragraphs.

[0106] The graphical representation of the secondary computer display described previously may also be displayed on the primary computer's display when the user performs a specified command, such as when the user moves the cursor with a mouse pad or drags a touch-sensitive command to the edge of the screen. This command could enable all of the abilities previously described relative to this graphical representation; however, instead of controlling actions from the primary computer that are viewed from the secondary computer's display, the secondary computer interface **103** might be, both, viewed and controlled from the primary computer.

[0107] Consequently, as the cursor is moved or other action is dragged to the edge of the primary computer screen, the interface **103** scrolls the screen in the direction of the movement or action to the elements comprising the secondary computer interface **103**. Going further, the user might be able to view the same secondary computer interface **103** on both the primary computer's display and on the secondary computer's display simultaneously through provision of each of the methods previously described.

[0108] Since the processes to store data locally and/or visually synchronize graphical interfaces **103** might be practiced as modules **100** and/or plug-ins that are incorporated in separate computer programs that are accessed separately from other processes of the client system, the client system might require a separate form of identity authentication (e.g. username and password; biometric reading; etc.) from that which is used to access other processes of the client system.

[0109] Where these particular processes are incorporated in and controlled through the same module **100**, plug-in and/or a single computer program that comprises other processes, the same authentication controls required to validate the identity of the user prior to accessing those other processes could also serve the purpose of permitting access to localization or visual synchronization, although it might also be possible to require additional levels of authentication in order to grant access to the particular processes.

[0110] If the user chooses to have her or his user data stored in an encrypted format, the client system may generate and retain an encryption key for decrypting the data that can only be accessed by the user after providing some form of identity authentication. This encryption process pertains to both data stored on the client-side, which would simply be converted to an encrypted format, and data stored on a mainframe computer. The client system may incorporate an option for the user to graphically display a “window” into the user database **106** that mirrors a particular subset of the user’s data that the user may be interested in.

[0111] Through this “window”, the user may view and select, in the same encrypted format, the said data as it appears within the user database **106**. In other words, even if the user database **106** resides on the mainframe, the user would be able to navigate the files there contained as if the user was able to directly access the mainframe computer and navigate the file system to gain access to her or his user database **106**. The same process may be accessible through the client system even if the user database **106** resides on the client side, to enable an alternate means of access rather than navigating the file system of the client computer’s operating system **113 114 115**.

[0112] The client system may generate an option to configure the client system to “privatize”, and/or to “anonymize”, a single data communication, a particular set of data communications, or all data communications originating from the client system. In addition to applying such settings through the said “window” process, the user may be provided the option to configure other types of data and categories of data in these ways, through a designated settings page or, in addition to the settings page, through inline privacy selectors. These inline privacy selectors may be accessed by toggling a menu that appears wherever the desired data or category of data is displayed on a given page.

[0113] Thus, if the client system were configured generate suggestions based on the

user's location if location-monitoring services (such as GPS on a mobile computer) are enabled or if the user has enabled automatically connecting to available communication networks (such as Wi-Fi), where, for instance, the client system could recognize if the user was near or inside of a particular marketplace based on the user's IP address, because of the inherent privacy concerns of such a process, an option to anonymize and/or privatize such communications would be provided to the user.

[0114] Privatization is accomplished by disabling a process with respect to certain parties, or altogether. By this, the data related to the process would not be transmitted from the user's account to the specified parties in any form. Anonymization is accomplished by encrypting and rerouting data communications, thus not completely disabling and eliminating the benefit of the related process, while masking the user's identity and location. A process that could achieve these goals is known as "Onion Routing".

[0115] Thus, when anonymization is enabled for a particular data communication, the data and its destination are encrypted and re-encrypted multiple times, and sent through a virtual circuit comprising successive, randomly selected relays. A relay is used to decrypt a "layer" of encryption to reveal the next relay in the circuit in order to pass the remaining encrypted data on to it. The final relay decrypts the last layer of encryption and sends to the external party the original data without revealing the identity of the user from which the data originated (*Tor Project*, 2013).

[0116] A user who is interested in viewing how the user data appears in the user database 106 might select from a list of subsets of user data that have been encrypted, to see the related data in its encrypted format. By this list, the user could also see which areas are not encrypted, such as certain data communications with certain external parties including other users, and choose to encrypt and/or anonymize (or, alternately, to decrypt and/or de-anonymize) the related data (further described in subsequent paragraphs).

[0117] The client system may generate to a user an option to view all of her or his own user data as it exists in the user database 106, wherein the user could select certain data and decrypt the particular data for her or his own personal viewing, and also apply anonymization and/or privatization to specific data. Options to display other information relating to user privacy may be provided to the user, such that the user may be able to see the IP address through which a

particular process has been routed if anonymization is active (again, further described in subsequent paragraphs).

[0118] Anonymization and privatization represent methods of “selectively encrypting” a particular set of data that is transmitted between multiple parties and/or an entire channel of data transmittals between multiple parties. Selectively encrypting a particular set of data (as by an inline privacy selector in a “window” viewing page of user data as provided in the example above) translates the said data set into an encrypted format for which the client system of the user to which the user data pertains, as well as any users with whom the said user has chosen to share the said data with, possesses the encryption key. When an entire channel of data transmittals is selectively encrypted, all data sets transmitted through the channel may also be translated into an encrypted format for which the client system of the receiving party possesses the key for decrypting the said data set.

[0119] User data may be subjected to a processing activity by which the data is analyzed and mined, called the mining process **107**, and wherein either the resulting data augments the user data that is descriptive of a particular user and the resulting data, in itself, becomes user data, or the resulting data augments the processing data that is used to analyze and mine the user data, which is called mining data, and the resulting data, in itself, becomes mining data. In other words, the data produced by the mining process **107** either describes a particular user or alternately describes the process of analyzing and mining in and of itself. This mining process **107** may, among its many uses, be applied to a broader process of the client system by which feedback may be generated from the basis of a set of user data.

[0120] The scope of the present invention is not limited to, and may encompass all data abstracted from all users of the World Wide Web, such that the World Wide Web, itself, exists as a compendium from which user data may be mined **107** and feedback may be generated (e.g. a search engine). A module and/or plug-in of the present invention may, for example, be implemented as a search engine that incorporates suggestions for products and services (further described in subsequent paragraphs), by which a user may choose to donate the proceeds of consideration (e.g. monies) generated from such suggestions to a third-party of her or his choice.

[0121] The user might select the third-party she or he wishes to collect the consideration generated from such suggestions by accessing a page wherein a list of options are provided to the

user and selecting one or more of these options. These parties may include organizations such as nonprofit and/or research companies, or individuals such as medical advisors (further described in subsequent paragraphs).

[0122] The location upon which the code, that generates the mining process **107**, resides is referred to as the mining process database **108**. The code itself is called, mining process **107** data. User data that is stored on the user database **106** may be transmitted **107** to a mining process database **108** and application, which normally reside on the mainframe but may also reside on the client side through the localization process.

[0123] The mining process **107** may incorporate a process by which a statistical analysis of user data is performed by, for example, computing the probability of correlation between the individual user's inputs and the total population of corresponding inputs for all users and with respect to various criteria using a pattern-recognition model (e.g. neural network; multinomial logistical regression analysis). The total population of corresponding inputs for all users may only describe user data that is abstracted by a particular module and/or plug-in, or it may describe user data that is abstracted by the combination of all modules and/or plug-ins encompassed within the scope of the present invention. One of the outcomes of the mining process **107** is the generation of a type of user data called feedback data, which may be transmitted, from the mining process database **108** residing upon the mainframe **108** or, alternately, upon the client-side to the user database **106** residing upon the mainframe **106** or, alternately, upon the client-side.

[0124] The feedback data may be transmitted from the mining process **107** **109** after the probability of correlation between the individual user's inputs over the total population of corresponding inputs has been computed. If the transmission occurs between physically-disparate computer elements such as between the mainframe and the client-side, the data may be encrypted with a key that is stored upon the client system database **104** of the same user, to whom the particular encryption key pertains, by which the same data may be decrypt.

[0125] In addition, the user is assigned a generic identification key upon registration that replaces and effectively anonymizes the user's personally-identifiable data when user data leaves the client system database **104**, and, also, is used to decode the anonymized data as it enters the client system database **104** from a remote element, such as the user database **106** when it is

stored on the mainframe. Through this decoding process, the content delivered from the various remote elements to the client system database **104** corresponding to the client system being run by the user, may, then, distinguish the user's data from the population.

[0126] User data may further comprise data that is, in some form, descriptive of events occurring in the normal course of the user's life (i.e. life events) and which may recur. These events may be disassociated from events in which the user substantially deviates from her or his life activities that would not be useful in a dataset subjected to a process(s) of the client system directed at monitoring and/or assessing aspects of the user's life. Disassociation may occur for the purpose of distinguishing disparate elements. Hence, another type of user data may comprise data that is not descriptive of events occurring in the normal course of the user's life.

[0127] Life events may further be categorized into sets of events called life activities. Examples of a specific life activity may include: heart rate during exercise, caloric intake at particular intervals of time, number of hours slept at night, times during the day spent working, number of social interactions after work, mood after a particular social interaction, and blood-sugar level. Sets of life activities may be broadly-defined as a category of life activities, called a "life area", which may include: physical activity, eating habits, sleep habits, work habits, social habits, personal psychology, medical conditions, and any other ranges of related life activities.

[0128] A user could be compelled to practice the present invention in order to receive feedback pertinent to life events, life activities, and life areas. Such feedback may be generated through the processes of recording life events, mining the data associated with the recorded events for inferences, and presenting the data associated with these inferences in the form of feedback through a user interface **103**. Data that is associated with a particular user which is generated in the course of such processes is encompassed within the use of the term, user data. However, user data may also refer to data that is associated with a particular user which is generated in the course of other processes that do not involve the user's life events, such as registration and configuration of the client system.

[0129] Within the context of the present invention, the term, "recording", which may be used interchangeably with the term, "tracking", is understood to refer to an inputting process by which raw user data pertinent to a particular subject is captured, retrieved, and converted into a format that is capable of being deciphered by an electronic medium, and may pertain specifically

to the process of recording or tracking life events, though the use of the term is not limited to only life events but may involve any other events or activities by which inputs, that are converted into user data, are generated.

[0130] Where it relates to the process of recording life events, the user prepares the inputs by installing a client system on a client computer, conducting life activities, and, either: manually keying-in or voicing-in data entry through the client system upon receiving a prompt through the client system soliciting such entries or upon the user's own compulsion; or, by interacting with sensory devices, which may be built-in or added-on to the client computer, that are configured to collect data and transmit the said data to the client computer.

[0131] A sensory device is an electronic medium that incorporates sensors and may be worn about the body or otherwise set up in the user's physical environment in some fashion. The sensory device may be able to detect changes in the user's body and/or environment, and usually incorporates an element by which the data generated by the sensory device's detections may be transmitted to electronic media (e.g. client computer) through which the sensory detections may be converted into data that can be processed and output.

[0132] A pulse gauge, an electroencephalogram, and a glucometer **514** are examples of elements that incorporate sensors, typically lack an apparent physical and logical association with the hardware encompassing the processing element(s), and are hence referred to as sensory devices. Various methods of recording are further described in subsequent paragraphs. The user data captured during the recording process could, alone, help the subject with recalling events from which she or he might develop inferences.

[0133] The process by which inferences are generated could also refer to an arrangement whereby raw data **105** is processed **109** by a statistical analysis and/or mining techniques carried out through an electronic medium, by which data that bears inferences resulting from the said processing of the raw user data is generated and subsequently presented to the subject.

[0134] The process by which inferences are generated could further refer to an arrangement between a user and another user, such as a care provider, whereby the user data generated through the process of recording is transmitted to and analyzed by the other user, and the inferences generated from the other user's human analysis are converted into a format that is capable of being deciphered by an electronic medium and subsequently presented, through an

electronic medium over a communication protocol such as the Internet, back to the original user.

[0135] Even further, the process by which inferences are generated could refer to an arrangement between a user and another user, such as a care provider, whereby the user data resulting from the process of mining is transmitted to and analyzed by the other user, and the inferences generated from the other user's human analysis are converted into a format that is capable of being deciphered by an electronic medium and subsequently presented, through an electronic medium over a communication protocol such as the Internet, back to the original user.

[0136] The data bearing the user data-based inferences that are presented back to the original user may be referred to as feedback data. The process by which feedback data is presented to the subject could refer to an arrangement whereby the feedback data is formatted into an expression that is decipherable by the user such as text, charts, and graphs applied to a graphical user interface **103** and/or voice that are transmitted to and exhibited through the appropriate elements encompassed within the client device. This result of this process, which may supersede any of the aforementioned processes for generating user-data based inferences, is called feedback.

[0137] Feedback might help the individual with identifying inferences that she or he may not have arrived upon otherwise; possibly due to restrictions in the person's own time or expertise. The processes by which feedback may be generated (namely, recording, mining and presenting) are, each, encompassed within the process of "monitoring".

[0138] Feedback may depict, through the written word, as well as through visual illustrations (e.g. charts, graphs and diagrams), the results of the mining process **107**. Such results might relate to, for example, how the subject was feeling during the performance of a specific activity over a certain time frame and in comparison with other subjects with similarities based on certain criteria such as age, weight, preexisting medical conditions, etc. The subject may affect the composition of the feedback to be presented to her or him by defining her or his goals within the client system.

[0139] One way in which a subject may define her or his goals may involve the display of an interactive image (e.g. Adobe Flash or HTML5- coded) representing a chronological graph by which the subject might select a certain time along the graph and create events, which may represent a desired target, that corresponds to the selected time. The user might also, from the

display elements provided for the user's entry of the particular event, define individual future dates for an event or establish the event as recurring at a particular interval of time.

[0140] Feedback may be displayed by the client system through the client system interface **103 110** when the subject consciously selects certain menu options to access various areas of their feedback, and/or on an "as needed basis". In the latter instance, information that is found to be of a higher importance, through analysis of the subject's previous inputs, may be displayed to the subject without the subject's conscious input **101** in the "notifications" area of the subject's device, where the subject may see options to either dismiss the feedback or obtain more information related to the feedback.

[0141] If the client system identifies a trend in the user data that poses negative implications, feedback might comprise, for example, advice that takes into account the activities that preceded an improvement in the conditions of other subjects. The client system may provide the user with an option to rate the feedback generated by the client system on various criteria such as accuracy, completeness and relevance. An option for a subject to rate the feedback generated from the client system would provide the mining process **107** with additional datapoints from which to draw inferences and develop assessments. Thus, a negative rating may cause the mining process **107** to gather feedback from the next most-closely mapped assessment, and a positive feedback may reinforce the previous decision of the mining process **107** and produce similar results upon the next occurrence of similar inputs.

[0142] In any of these instances, the client system, provided with enough user data on the particular user to sufficiently predict the actions and related outcomes produced by the user's tendencies to a certain degree of accuracy, may be configured to simulate, through the mining process **107**, the user's inputs under various circumstances, as well as, if mutually exclusive, the inputs predicted to impart optimal benefit to the user under various circumstances.

[0143] Hence, the mining process **107** may further enable the client system to incorporate prior inputs and the resultant inferences and feedback in a simulation of the user's inputs, and/or the inputs predicted to impart optimal benefit to the user. The results of this simulation might be presented in the form of a suggestion or suggestions to the user on a choice or choices that the user may approve for input and subsequent processing (i.e. input suggestions).

[0144] Alternately, the client system may select what is predicted to be the optimal

choice and thus complete the input on behalf of the user without presenting a suggestion (i.e. input automation). The opportunities to which input suggestion or input automation are applied would depend upon the user's indicated preferences.

[0145] In addition, the extent to which input suggestion or input automation is applied to such opportunities would depend upon the user's indicated preference (i.e. input suggestion or input automation based on the user's predicted input and/or the optimally beneficial input). Some manners by which input suggestion and input automation may be applied to various aspects of the monitoring process are described in subsequent paragraphs.

[0146] A user may choose to share with other users, privatize and/or anonymize information on their account through a page that displays all of the life areas that the user has previously chosen to be included in the monitoring process for their particular account. Alternately, wherever each life area (or, more generally, any element that may be privatized and/or anonymized) is incorporated in the content displayed on the client system interface 103, an "inline privacy selector" may be displayed adjacent to the referenced element. This inline privacy selector may be discerned by the appearance of a button or menu, and allows the user to choose the extent to which the pertinent element should be shared with or privatized from other users. Such elements may include raw user data and feedback generated through the mining process 107.

[0147] Because user data is inherently personal, the ability for a user to control the outflow of her or his data from the client computer in order to gain an essential level of comfort over the use of the said data is germane to the utility of the present invention. Notwithstanding, a user might benefit from being able to control, not only, the flow of valuable data to an external party or parties but, also, the sale of the said data and may, thus, be empowered to share data originating from her or his client computer with the said parties in exchange for some form of consideration.

[0148] For instance, casual acquaintances such as friends and family, may send and/or receive user data from a particular user, in order to promote general discussion, or more specifically, to coach, socially interact and/or motivate each other to reach goals. Additionally, medical advisors and other care providers could study user data to better understand the user's condition and augment the delivery of their services, while researchers could incorporate such

data in the conduct of various studies.

[0149] The clinical application of the present invention, whereby user data might possibly facilitate the development of new medical treatments and practices, could compel a user to practice the present invention for altruistic reasons alone. A user sharing data with a researcher might facilitate the conduct of remote research studies; partially or entirely negating any requirement for the user to be in the physical presence of the researcher for direct observation. A user sharing data with a medical advisor might provide the medical advisor with a means for monitoring a user's condition on a more continuous basis in between regular medical checkups. A user sharing data with a healthcare facility might enable the facility to forward the user's data to medical staff who are overseeing the user and who may be able to utilize the data in their work.

[0150] Having established that an individual who practices aspects of the present invention as a "user", a user may be further described as a "subject" or "practitioner". The terms "subject" and "practitioner", as well as the terms pertaining to various types of subjects and practitioners that will be identified and described herein, are used as examples for the purpose of describing a particular embodiment of the present invention.

[0151] Where any one of these terms is used to describe a particular user, it is implied that the particular user may bear characteristics that extend beyond the scope of the definition of the said term. Such characteristics may be descriptive of another type of user than the type of user that was described by the said term and, thus, the use of the said term implies that any of the plurality of terms used to describe a user might also apply and/or be used in the place of the said term.

[0152] A user who is subjected to the process of recording life events is referred to as a "subject". It may also be possible for a user to make use of the user data generated by way of such processes where applied to a plurality of subjects. In order to be distinguished from those described as subjects and casual acquaintances, such users, who may be further described as medical advisors, healthcare facilities, and researchers, are referred to, collectively, as "practitioners".

[0153] The nature of, and extent to, which a user might choose to share information may also vary. While one subject connecting and sharing data with another subject might be as

simple as performing a search on the user's name and/or email address and choosing an option to connect, the process for connecting with practitioners might involve more steps, which are described in subsequent paragraphs.

[0154] With reference to FIG. 3 depicting, in accordance with some embodiments of the present invention, the flow of data between the mining module and external parties **300**, the monitoring process may be embodied within a plurality of modules **100** when a module **100** is initially installed separately to analyze user data pertaining to one separate life area, but be configured to integrate with other separately-installed modules **100** analyzing user data pertaining to other life areas, and, through such a configuration, analyze and correlate user data over the broader range of life areas.

[0155] Hence, user data inputted in one module that is applicable to another module may not need to be inputted again to be correlated with the user data in the other module. In this example, the user might install the modules **100** for the particular life areas that she or he is interested in and, where integration is desired, configure these modules **100** to interact as by the processes described above, as well as by other processes, through options that can be toggled within the client system.

[0156] A particular module **100** that aggregates and evaluates, with respect to one another, individual sets of user data, extracted from other various modules **100** that incorporate a monitoring process, in order to generate feedback that comprises user data from all applicable modules **100**, is called, the "mining module". The mining module may prove useful as a method of integration where relevant user data, from a plurality of modules **100** that incorporate a monitoring process (hereafter referred to as, "recording modules") **301** that may be developed by separate, unrelated parties (i.e. "independent developers"), and wherein each solution might monitor separate life areas such as diet and exercise, are transmitted **302** into the mining module, whereby the individual sets of user data are aggregated and evaluated with respect to each other to generate feedback **304** on a single client-side interface **103**.

[0157] User data may, initially, be transmitted to the mining module in a variety of ways: by a sensory device which may transmit the data directly to the mining module; by a sensory device which may transmit the data to a recording module, from which the data is transmitted to the mining module; or in the absence of an add-on sensory device, the client computer employed

in the mining module may be used (through conscious inputting **101** or through the computer's built-in sensory capabilities) to transmit data to a recording module, which may transmit data back to the mining module. The mining module may collect data obtained from recording modules by coding the mining module to extract and aggregate data for a particular subject from the application programming interface **103** of the recording module. Alternately, the developer of the mining module may develop a "plug-in" which, when coded into a recording module, transfers data for a particular user from the recording module to the mining module.

[0158] Such a plug-in may additionally comprise of computer programming code for functionalities that are typically utilized by solutions developed by separate, potentially unrelated parties (e.g. "independently-developed solutions"), such as: a functionality for displaying through a graphical interface **103** the user feedback generated from analyzed data; a functionality for aggregating and analyzing the user data; a functionality for converting sensory read-outs from sensory devices into raw data **105**; a functionality for encrypting, storing, categorizing and/or any other means of processing and presenting the data collected by the solution, which may be described in the other modules **100** of the present invention. This computer programming code, when incorporated into the code of the independently-developed solution, would take the place of and thus eliminate the need for what the developers of the independently-developed solutions (i.e. "independent developers") might have otherwise been required to develop and incorporate themselves in order to build a functional computer program and/or device that could stand alone.

[0159] Similarly, any of the processes incorporated in a monitoring solution such as those described by the present invention could be made available to an independent developer through the provision of computer programming code that could be incorporated into the independently-developed solution (i.e. plug-in), which might ultimately help to defray development costs for the independent developers. Within the computer programming code of the plug-in may also be included the commands to transfer user data to the mining module from the independently-developed solution that has incorporated, into its computer programming code, the plug-in. A plug-in might thus prove useful for occasions where a recording module has been or will be developed separately from a particular mining module, and the ability to transmit user data from the recording module to the mining module is desired.

[0160] Because a particular process may be practiced as a module **100** and/or plug-in that is incorporated in a separate computer program that is accessed through a separate executable file, as in an independently-developed solution, the client system might require a separate form of identity authentication (e.g. username and password; biometric reading; etc.) from that which is used to access other processes of the client system, including the monitoring process. Where the particular process is incorporated in and controlled through the same module **100**, plug-in and/or a single computer program that comprises other processes including the monitoring process, the same authentication controls required to validate the identity of the user prior to accessing those other processes might also serve the purpose of permitting access to the particular process, although it might also be possible to require additional levels of authentication for accessing processes of the client system that permit access to more sensitive information.

[0161] Whether the recording modules **100** are configured to recognize if the mining module **100** is installed or if the mining module **100** is configured to recognize if, and which particular, recording modules **100** are installed; in either instance, the mining module **100** is able to receive user data from installed recording modules **100**. The logic used to carry out this communication is coded into the mining module **100** and/or the recording modules **100**. It may be that the mining module **100** is not coded to recognize from which modules **100** the data is coming from, or what the data is intended to describe, but is coded to receive data from any module **100** that is coded to transmit the data to the mining module **100** and describe the nature of the particular type of data i.e. categorizing. Conversely, the mining module **100** may be coded to specifically read and categorize data from a certain set of modules **100**. In summary, the mining module **100** would be coded to receive and discern the different types of data, the elements, such as life activities, they are intended to describe, and how they ought to be aggregated and analyzed.

[0162] Whether user data originates from multiple recording modules **100**, including those developed by other service providers, or from the mining module **100**, the data may be transmitted to the user database **106**.

[0163] In addition to allowing the subject to enable privacy controls for certain processes, an option may be provided for the subject to enable automated privacy through the same or similar processes by which input automation and input suggestion are incorporated in

the client system. Automated privacy uses the assessments derived from analyses performed on inputs collected from the subject to decide which processes the subject would be more likely to select for privatization or anonymization, and either automatically privatize or anonymize those processes or display on the client system interface **103** a suggestion to privatize or anonymize a certain process. The analysis may be performed in a mining process database **108** as described in the preceding paragraphs that collects the subject's user data (which in this instance may include both user data and non-user data), and the analysis may comprise of analyzing behaviors that may be indicators of the subject's risk tolerance and the factors that may influence the subject's risk tolerance.

[0164] For instance, a subject has previously selected the option to privatize any monitoring feedback with certain types of external parties (e.g. researchers) **303** may receive a suggestion to privatize and/or anonymize all future communications with the same (e.g. researchers) and/or similar (e.g. merchants) parties. Alternately, a subject that chooses to only share monitoring feedback with certain types of user connections (e.g. social connections) may receive a suggestion to privatize and/or anonymize all communications with any other types of user connections (e.g. practitioner connections; merchant connections). The client system may also analyze certain behaviors such as what kind of news stories the subject reads (e.g. stories on information security) to suggest tighter controls in general, or in specific areas (e.g. if subject reads stories on data sharing with researchers, suggest privatizing and/or anonymizing data connections with researchers). Certain behaviors may also predict a subject's disinterest in certain areas (e.g. if a masculine male) and automatically anonymize and/or privatize communications with certain parties (e.g. women's health merchants).

[0165] By privatizing any communications with a particular type of external party, suggestions for goods and services of the selected external parties generated by the client system may automatically preclude the blocked category of external parties within suggestion results. Privatizing a particular type of data communication within the client system (i.e. suggestions for goods and services of an external party) may automatically block the data communication (e.g. suggestions) from executing at any time during use of the client system.

[0166] While anonymizing any communications with the external party may still allow the particular type of external party to appear in suggestion results, and anonymizing a data

communication within the client system may still allow the data communication to execute, the particular category of results and/or the particular data communication may be marked as a low priority and thus be generated less frequently, and any outgoing data would be anonymized in order to render the recipient party incapable of identifying the subject's identity and/or location in any way. Conversely, the subject may also be provided with an option to receive suggestions to allow and/or de-anonymize certain data communications, and the same behavior analysis logic may be used in a process that automatically generates suggestions on and/or automatically configures other processes, such as, for example, friend suggestions and emergency services, as well as the options pertaining to those processes.

[0167] Allowing and/or de-anonymizing certain data communications, including the sharing of user data, is a process that may be initiated by, either, conscious inputs 101 performed by a user, or, if the user so desires, automatically by the client system through the toggling of options either consciously, or, if the user so desires, automatically by the client system. Where the client system is configured to share user data automatically, whether by options that have been toggled consciously by the user or automatically through the configuration of the client system by the user, the client system might access the user data in order to analyze the user's past habits as well as future preferences in sharing information with other users.

[0168] The mining process 107 would attempt to distinguish items that had been shared by the particular user in the past by their characteristics. A shared item which, for the purpose of illustration, could exist in the format of a particular image, might be scanned and mapped to a database of items, or images, marked up (e.g. tagged) with metadata describing the content of the said items stored in the database. From there, the mining process 107 may associate the metadata of the most-closely mapped item to the shared item that is the focus of the said analysis. The manner in which items with certain characteristics had been deemed most likely to be shared in the past by the mining process 107 may then be associated with items detected from content on the Internet and/or the user's activity on a particular client computer. These associations might then be used to instruct the client system to share the said items that are the focus of the associations with certain users in certain manners that the user(s) would be most likely to prefer.

[0169] In the broadest application of this process, hereafter referred to as "automated

sharing”, items to be shared could comprise data detected through any activity on a client computer. Granted, few users would feel comfortable yielding such autonomy where the user database **106** and mining process **107** reside on a remote server; however, the process might be found exponentially more useful where such a potential compromise in privacy is prevented through the option to maintain the elements comprising the user database **106** and mining process **107** at the local level on the client computer.

[0170] Whether the said elements are maintained at the local level or remotely, automated sharing could be configured to restrict its functioning to only certain categories of items and/or users, or specific items and/or users. Thus, a user, who in one instance may be a subject, might configure the client system to only apply the automated sharing process to items comprising data generated through the monitoring process of a subject through the client system. The same user might also configure the client system to only allow the automated sharing of such items with a certain category of user connections, such as close family members, or a medical advisor.

[0171] Considering, as an example, a user that has configured the client system to monitor life events and activities pertaining to the area of “career”, by which the client system recognizes and transmits data that could provide relevant professional insight to the user: The analysis of the user’s behaviors, as well as the particular user’s social connections’ behaviors, could generate a list of social connections with whom the sharing of this particular data, presented to the social connection in a particular manner, would be likely to produce positive results, through an analysis based on the monitoring activity of the particular social connections. The strength of the correlations produced by the mining process **107** could be weighed against any other configurations of automatic sharing indicated by the user, either, at the initiation of the process or at any point thereafter, to produce an optimal result. Note that in this example, depending upon the particular user’s preferences, the term, social connection, could be used interchangeably with any other type of user connection, or any other type of user that is not a user connection.

[0172] Furthermore, within the present invention may exist individual processes, for which the user has the ability to access sets of options pertaining to each individual process. The user may access a page wherein the user may select from a set of options that pertain to a

particular process to configure the client system to perform a certain set of commands in order to behave in a certain way in relation to the particular process.

[0173] In addition to consciously-configuring the options pertaining to each individual process, which would apply the lowest-level of settings specific to the individual process within the set of options, the user may also be provided with an option to, from a set of higher-level options, apply settings for all or a number of processes through a single selection. Within a type of page of the client system that may hereafter be referred to as the “global application settings”, the user may view and toggle various sets of options at various levels of detail. While a lower-level of detail might pertain to a set of options that could be applied to only a specific process, a higher-level of detail would pertain to sets of options that could be applied to various tasks (e.g. compile; connect; send) that may be embodied throughout numerous processes of the client system.

[0174] For instance, selecting an option pertaining to “compiling” may enable a user to choose what data to preselect for sharing with others. Thus, a user might be able to, within all areas within the client system involving a data compiling process, apply the same option. Choosing “conscious input” 101 from the set of options pertaining to “compiling” might prevent the client system from preselecting any data for the user to share with others. Choosing “starred” from this same set of options might designate the client system to preselect only highlighted or “starred” data, that the user has designated for compiling, to be automatically preselected in order to be shared with other users in only the selected processes of the client system that incorporate a data compiling process (e.g. the social processes). For the purpose of distinguishing a higher-level process from one of a lower-level of detail, a higher-level process may be designated as an “area” (e.g. the “social area”).

[0175] Additionally, the user may select an option to “automate” the processes associated with the aforementioned options, whereby the user’s social profile that is visible to other users is automatically populated only with certain data that the user would have any inclination to share with those certain users, based on a behavior analysis conducted through the mining process 107. Thus, the mining process 107 would determine with whom the user would prefer to share all data incorporated in the user’s social profile, and with whom the user would prefer to share only some data and also, which data. Furthermore, if the user were to connect with any research study, the

information that the user would be willing to provide would already be preselected. However, the user would still need to select with whom and how to share the information, which might be toggled in the sets of options pertaining to “connecting” and “sending”, respectively.

[0176] In another scenario, selecting an option pertaining to “connecting” and, also, from a set of options at a lower-level of detail, selecting “everybody”, and from another set of options at a lower-level of detail, selecting “conscious input” 101, may cause the client system to automatically match and present the user with all opportunities that could benefit others (e.g. research studies; live cell donor opportunities; friend suggestions). Instead of selecting “conscious input” 101, selecting “automate” would present only those opportunities that the user might be interested in based on a behavior analysis through the mining process. In the same scenario except, instead of selecting “everybody”, selecting “no one”, might cause the client system to not automatically match and present the user with any opportunities that could benefit others, which might be useful when the user desires consciously searching for and identifying such opportunities, themselves.

[0177] In order to execute the command which sends the pertinent data that could benefit others from one user to the other, the user from which the data originates might select from the set of corresponding options. Selecting an option such as, “conscious input” 101, might designate that all pertinent data, aggregated in the manner of the selected preference discussed in the previous paragraph, may only be sent through the conscious input 101 of the user. Selecting an option such as, “always push”, might designate that all pertinent data, whenever it is available, may be automatically sent to others whenever possible. Selecting the option such as, “analysis”, might designate that all pertinent data may be sent to others based on a user behavior analysis conducted by the mining process 107 to predict how the user from which the data originates would send data to each user under each particular set of circumstances.

[0178] In addition, the user could apply filters to options applicable to individual categories of processes and, furthermore, to individual processes, which, in the situation of a “sending” category of processes, could allow the user to select an option to “automate sending through social processes only” while designating, by another option, “conscious (e.g. manual) sending under all other circumstances”.

[0179] Within the same global application settings page of the client system from which

the user may view and toggle various sets of options at various levels of detail, a higher-level of detail might provide a single “automatic settings” option that the user may select. Like the “automate” functionality described above, this automatic settings option may then initiate a set of commands within the client system to, within the mining process **107** (described in the preceding paragraphs), analyze certain user data that is useful for predicting how the user would consciously configure settings for each of the client system’s individual processes. Thus, the user would not need to consciously configure each of the client system’s individual processes nor toggle any of the lower-level options provided on the global application settings page, and the client system would automatically choose settings that the user might select based on an analysis of the particular user’s user data.

[0180] Contrast this with the sets of options pertaining to each individual process, which in and of themselves may provide an “automate” option that the user may select to automate certain tasks (e.g. compile, connect, and send, as above) within the individual process; tasks that might otherwise require conscious input **101**. This “automate” functionality at the individual process-level would utilize similar behavior analysis logic as described in the incorporation of the mining process **107** in the global “automatic settings” option, or, might utilize identical behavior analysis logic as described in the preceding paragraph to be applied to the specific process.

[0181] The aforementioned privacy processes may also be provided in the form of, either, a plug-in that can be downloaded and installed into independently-developed solutions, or a stand-alone module **100** that could be downloaded and installed onto the user’s operating system **113 114 115**. These approaches for practicing this process of the present invention may analyze behaviors through the same method described above and generate suggestions to and/or automatically privatize or anonymize certain data communications, or permit the user to select an option to privatize or anonymize certain data communications consciously.

[0182] For example, the plug-in or module **100** could analyze all active processes running on the user’s computer to determine which processes are sending and/or receiving data over a data communication protocol such as the Internet. The processes that are positively identified as sending and/or receiving in such a manner could subsequently be subjected to, either, input suggestion or input automation relative to privatization and/or anonymization,

depending on whether the said processes are likely to be trusted by the user based on the user's behaviors (through the same mining process 107 as described in the preceding paragraphs) and/or indicated preferences.

[0183] A user may nonetheless utilize a plurality of client computers that are configured differently and may, at certain times, prove more useful than at other times. While a mobile / small screen configuration may be necessary for the user to run the client system to conduct monitoring activities while she or he is away from home, running the client system from a large screen configuration to conduct monitoring activities while the user is at home may be more convenient than using a mobile client computer.

[0184] In addition, the type of configuration employed may only permit for monitoring of different areas of the subject's life. The client system running on a mobile client computer may generate suggestions of locales that are within the user's vicinity as the user is traveling based on an analysis of the user's current status (which may include location, time of day, emotional state, specific directions i.e. conscious inputs 101, and prior experiences and preferences considering each of the aforementioned factors).

[0185] While operating such a process on a large-screen device may not be practical, running the client system from, for instance, the user's home entertainment system may allow for seamless, continuous monitoring of all of the user's television programming habits, from which user data may be generated and incorporated in the user's account (user accounts, which are described in later paragraphs). This user data may include the user's television program watching habits and, based on the user's current status including past experiences and preferences, automatically record certain shows that the user might be interested in or offer suggestions to record shows which the user might be interested in. In addition, the user's other monitoring activities while using the client system either at home or away from home could be analyzed to generate inferences about which television programs the user might be interested in.

[0186] The examples provided in the preceding paragraphs demonstrate the unique monitoring capabilities afforded by each client computer configuration. Because of these unique abilities, the client system that is designed to be installed and run on each different type of client computer configuration may incorporate different elements of the present invention described herein, and/or may incorporate the same elements, but possibly in different ways. Taking the

process of monitoring television programming habits as an example, the client system, when being run from a mobile client computer, while perhaps not being as suited for the task as a home entertainment system, may still incorporate this process, albeit, with some differences in its operation.

[0187] The mobile computer, configured as the client computer, could utilize near-field communication or some other form of two-way data communication to form a link to home entertainment system. By this link, the client system installed and being run from a mobile computer may have the ability to monitor the user's television program watching habits and, based on the user's current status including past experiences and preferences, automatically record certain shows that the user might be interested in or offer suggestions to record shows which the user might be interested in. This link may describe any arrangement involving connection between a user's mobile computer and a home entertainment system, including integration between the client system and the element which is used to display the television programming on the home entertainment system.

[0188] This element may describe the device which connects to a communication protocol used to transmit the television programming to be displayed on the home entertainment system (e.g. a cable set-top box). Integration with such an element might involve a remote control functionality within the client system that is capable of establishing a connection capable of producing television programming results and options within a menu wherein a user may search, display, and record available television programming. Such integration may, furthermore, through the input of information about the television programming provider, record user activities through the remote control functionality. In addition, the user's other monitoring activities while using the client system either at home or away from home could be analyzed to generate inferences about which television programs the user might be interested in.

[0189] In addition to being consciously-controlled by touch as in a traditional remote control, television programming selection and recording may be controlled through voice command, as well as through user data comprising inferences about the user's television program-watching habits. Based on an analysis of user data which may include EEG, heartbeat, pupil dilation and other physiological sensory readings as well as conscious inputs 101 indicating user satisfaction, the client system may be configured to suggest, or automatically select and/or

record certain television programming at certain times.

[0190] The user may also verbalize a command such as, "I want to watch something that will cheer me up," or, "Put something on that will make me fall asleep." If the client system is not configured to automatically make decisions related to television programming, the user may verbalize a command such as, "What do you think I should watch", "Put something on", or "Record something for me to watch later tonight," to have the client system to, respectively, provide a suggestion on television programming, select a television program, or record a television program, based on the totality of information available for the client system to base the decision on that would be most likely to satisfy the user.

[0191] Hence, regardless of the type of client computer configuration utilized to run the client system, the user may be able to login **202** to their account which contains all of her or his user data and experience many of the same processes (including monitoring) that are incorporated within the client system when used on other client computer configurations. If the user has chosen to store all data locally, however, the user will need to download and subsequently upload the user data from one client computer to another in order to synchronize user data across all devices. Otherwise, user data is sent to the user database **106** that is stored on a mainframe computer that connects with all client computers through a communication protocol such as the Internet.

[0192] With reference to FIG. 2 depicting user interface navigation **200** in accordance with some embodiments of the present invention; when the client system is run, such as by, for example, activating an executable file that initiates the client system which is installed as a program on the client computer, or by targeting a particular address on the World Wide Web from an Internet browser that corresponds to a website from which a user could access the client system, the user may be given the option to either log in to an existing account or to register a new account **201**.

[0193] Upon choosing to register an account, a content grouping might be displayed to the user requesting the input of a username, password and/or email address to be specified by the user, and/or biometric data that could be obtained from the user that could serve as a unique identifier of the user, such as a fingerprint, and thus potentially eliminated the need for a username, password and/or email address. This biometric data would be stored in an encrypted

format by the client system in such a manner as described in the preceding paragraphs; such that no person with access to the backend server storing the user data would be able to view the fingerprint.

[0194] Alternately, authentication of user's identity could involve presenting a "validation query" on information relating to certain monitoring events that presumably only the user would be able to answer correctly. The user may set the basis of the validation query in several manners. For one, the user may select from a list of pre-generated monitoring activities that are certain to occur at scheduled intervals (e.g. what did you have for breakfast today?).

[0195] Another manner involves the user selecting, as the basis of the validation query, from various pre-defined tasks such as speaking a command while performing a certain task and/or at a certain time of the day (e.g. looking at the price tag of an item, user says, "remember the price of this shirt I bought today for log in"; upon logging in, client system presents the query, "What was the price of the shirt you bought on Thursday, April 23rd?").

[0196] Yet another manner in which the user may set the basis of the validation query involves selecting an option to allow the client system to select the basis of the validation query at random (looking at the price tag of an item, the client system indicates, "price of this shirt is being saved for validation query", and user either confirms or rejects the proposal).

[0197] Other inputs to be entered by a user during the registration process might involve agreement to the terms of use, preferences relating to the frequency and timing of the display of content groupings from the client system as well as inputs specific to either a monitoring subject or practitioner that are further described in subsequent paragraphs.

[0198] A user might also be presented with an option to share, with the client system, data that may be stored on the user's client computer or, with the provision of any required login 202 information, on a remote server; files, which may comprise individual email messages that she or he feels comfortable sharing, downloaded data compilations from a user's activity with another service, chat transcripts, pictures, music and/or any other areas that may contain relevant user data. Where the data is stored on a remote server, the user might be present with the option to enter her or his login 202 information pertaining to email addresses and usernames from independent online services utilized by her or him, which may contain the relevant user data.

[0199] A process within the present invention that may exist as a plug-in or module 100

might, utilizing pattern-recognition algorithms that may exist within the mining process 107, scan the past activity of the particular user within the shared data, for relevant data that could be incorporated in the monitoring process to learn more about the user's experiences, circumstances, personality and interests, and accordingly customize the settings and processes of the present invention to the user's liking while possibly augmenting the history of the user data to incorporate any additional relevant details. These pattern-recognition algorithms would incorporate code for accurately identifying relevant activity such as that which might be indicative of the user's interests, and accurately interpreting and abstracting from the activity the details and related inferences that might be relevant in the analysis of the user data.

[0200] Prior to the execution of this scan, the user would be presented with the option to enter specific details regarding the data she or he would like to share, such as the specific data location(s) (e.g. certain folders and/or sections within the user's client computer storage or in an online account) by which the scope of the scan would be limited, as well as how this shared data may be integrated within the client system (e.g. within the monitoring process and/or in the social networking area). Examples of independent online services that contain relevant user data pertinent to a particular user, in addition to email clients, are cloud storage services, social networking sites, music and multimedia sites, discussion forums and message boards, online merchants

[0201] Past activity of the user abstracted from the shared data could be integrated within the monitoring process; as if the activities had occurred during the use of, and were consequently recorded in real-time by, the client system. Prior to integrating the activity, the client system might display to the user a query requesting confirmation of whether or not the client system's interpretations about the past activity are accurate, and whether or not the activity may be incorporated within the history of the user data. Such a query might request, for instance, confirmation of whether or not its interpretation that a particular user was interested in, and also, whether or not she or he is still interested in, archaic langauges based on some data identified within research papers authored by, and shared by, the particular user.

[0202] Alternately, rather than requesting confirmation over the detail directly, the client system might present the user with a series of choices and request that the user to confirm which choice she or he prefers, especially where the client system's interpretations involve details

related to the user's intuition and subconscious personality (i.e. input suggestion). For instance, prior word posts identified within the shared data could be analyzed for dialect and tone. The user might then be presented, through a query presented, either through a message consisting of text displayed on the client computer, or through an audible voice projected by the client computer, or both, with a series of phrases worded and inflected in different manners. This query would request that the user confirm which phrase she or he prefers, and the client system might subsequently display written messages and verbalize audio messages using the wording and tone preferred by the user.

[0203] After completing the registration process, a user may then choose an option that enables the client system to automatically login **202** the user using the previously entered username and password upon closing and reopening the client system, through client system code **110** that incorporates a command to check a writeable data file that is updated when the software is registered or logged into. For a user that chooses to register as a monitoring subject, additional inputs to be displayed in the registration process may include options to enable or disable areas of monitoring, and inputs to define the times of day that recording of life events is permitted.

[0204] Depending upon the subject's inputs, all content related to an individual area of user activity (e.g. nutrition; exercise; medical conditions, etc.) will be displayed to the subject only at specified time intervals, or not at all. The subject also is provided the options to enable the display of content related to all life areas, as well as to enable content display at any given time.

[0205] Enabling all areas of monitoring may permit the display of any content that may be meaningful to the subject by incorporating life areas in an instance where the subject may not have initially recognized a potential benefit. Because some content is more beneficial than others, the subject may be provided an option to enable display of content in certain life areas only in the instance of urgent matters. Such an option could prove to be crucial in a situation where a subject that has an undiagnosed medical condition, chooses to be monitored in but not to receive content pertinent to the life area that encompasses the particular medical condition, and shows patterns and symptoms that the client system could have recognized and informed the subject of, and thus, led to proper diagnosis and treatment).

[0206] Enabling display of content at any time enables content to be displayed immediately when an opportunity for meaningful recording of a life event and/or feedback may be more relevant to the user rather than queuing and backlogging the content to be displayed only at certain set time intervals when content delivery may not be as relevant. An option may again be provided to allow display of content at any time depending on the urgency of the content matter.

[0207] As in an alternative approach previously described, wherein user data is transmitted from independently-developed solutions to the “mining module 100”, the subject, during the registration process, after indicating her or his preferences, may be presented with, through the client system, a combination of independently-developed solutions that the subject could install as separate modules 100 and use concomitantly through pairing with the mining module 100 to assist in satisfying the subject’s preferences. These independently-developed solutions might effectively replace processes that might have otherwise been incorporated in a single executable computer program that also comprises the analytical and feedback processes such as those incorporated in the mining module 100.

[0208] For example, in the above referenced example involving the mining module 100, the subject, during the registration process, after indicating her or his preferences regarding the particular life area(s) to be monitored, might be presented with, through the client system, a combination of independently-developed monitoring solutions that the subject could install and use to monitor the specified preferred life area(s). These independently-developed solutions could effectively replace the monitoring processes that might have otherwise been incorporated in a single executable computer program that also comprises the analytical and feedback processes such as those incorporated in the mining module 100.

[0209] User data would be collected by these individual independently-developed monitoring solutions, and subsequently transmitted to a separate computer program comprising the mining module 100, where the user data would be aggregated from amongst the various monitoring solutions and processed 109 in order to generate feedback. The registration process for a user that chooses to register as a practitioner is further described in subsequent paragraphs.

[0210] The aim of recording 202 through, both, conscious 101, 101 and passive 102, 102 inputs is to collect sufficient data on a subject to generate suggestive feedback 109 in a number

of areas including nutrition, exercise, work habits, sleeping habits and medical conditions. To those ends, the client system would capture information about: food, drink, and medication ingredients consumed; the calories, nutrients, and properties related to the consumption of the said ingredients; calories burned; energy levels and cognitive performance; sleep timing and restfulness/restlessness; blood-glucose levels; brain activity; balance and posture; vision; and more, as well as how these various elements interrelate.

[0211] For instance, the data collected from the subject's consumption of certain supplements, which possess properties indicative of intestinal damage risk if consumed at a certain frequency, may promulgate the presentation of feedback to the subject by the client system suggesting that the subject consume a certain amount of liquid after taking the supplement. Some supplements are also better digested if taken with certain foods or liquids, and the client system could, similarly, present feedback suggesting which foods or liquids would better aid in digesting the supplements.

[0212] Where the subject is affected by a medical condition and the timing and/or manner of consumption of the supplements is not specified in the subject's prescription and/or is permitted at any time and/or in any manner by the subject's medical advisor, the client system may present feedback suggesting when might be a more effective time and/or manner in which take the supplement if there is medical research to substantiate the feedback that also considers the subject's unique circumstances. If the subject has had too much to eat before lying down on her or his back, and medical research suggests that lying down on one's stomach can facilitate digestion, the client system may present feedback that the subject lie down on her or his stomach.

[0213] In each instance, the timing and extent of any such feedback would depend upon the subject's preferences. If the subject had erroneously enabled an area of recording and/or feedback through her or his preferences that the subject would prefer to be disabled, the subject may be provided with an additional opportunity to, at the presentation of the related feedback, disable the area of recording and/or feedback to which the presented feedback relates. The action taken by the subject in order to disable the said area could involve manually interacting with graphical elements presented on a display screen, or verbalizing a certain command into a microphone, on the subject's client computer.

[0214] In another instance, data collected from all of the abovementioned life areas

(especially sleeping and eating habits, and other elements such as work commute length and communication tone) could, through the client system, be correlated to (by transmittal to and processing through the mining process 107), and be used to generate feedback in, the area of work performance (e.g. how to best optimize the quality and efficiency of work tasks performed by the subject. Such feedback, for example, might suggest to the subject, based on the subject's learning style and past performance, a particular sequence in which a series of specified work tasks might be performed to optimize the quality and efficiency of the tasks performed by the subject.

[0215] The specificity of these work tasks might be communicated to the client system through a keyed-in or verbalized description of each individual task by the subject or through the visual recognition capabilities encompassed in the embodiment of the client system running on a particular client computer. In the latter instance, patterns of movement, shapes and colors detected by visual sensors may be mapped to a database of such patterns, where new patterns may continuously be added, and the related activities (including specific work tasks) to which various patterns are correlated may continuously be augmented, through confirmation of the related activity by the subject's input response to a suggestion or inquiry prompt from the client system. In general, when the monitoring process requires conscious input 101 by the subject, the client system may display a question or series of questions through the graphical interface 103 aimed at gathering information about how the subject was feeling (perceived condition) and what they were doing (behavior) at the time of the monitoring entry.

[0216] The process of recording might begin when the subject is prompted to confirm the timing of the entry (depending upon the subject's preferences relating to timing of the presentation of monitoring content) and to answer a question or series of questions to provide the client system with datapoints to establish what the subject was doing at a particular time (e.g. "eating"). Depending upon the response, the subject may be prompted to answer a conditional question or series of conditional questions to provide the client system with more detailed information about what the subject was doing (e.g. "what are you eating?"; "how much did you eat?").

[0217] The same process follows when the client system displays a question or series of questions to understand how the subject is feeling (e.g. response of "dizzy" is followed by a set

of questions such as, “how dizzy?”, “how long have you felt dizzy?”, “have you done anything since your last entry that might make you more dizzy?”, “have you done anything since your last entry that might make you less dizzy?”, etc.), with consciously-input user data serving to corroborate and to potentially draw inferences between the subject’s perceived conditions and behaviors related to the subject-generated responses. These inferences are generated by transmitting the said user data to the mining process database **108** for assessment. Such a process may be of particular value in life areas where not a lot of research exists; for instance, where the subject is prompted to provide inputs that may be indicative of the efficacy of a homeopathic remedy attempted by the subject.

[0218] The client system collects user data around events. The likelihood and frequency of the selection of such events might depend upon an analysis of the subject’s conscious inputs **101** during the registration process pertaining to her or his monitoring preferences (e.g. “monitor this but do not monitor that”), present condition (e.g. “I have [a medical condition]”), and monitoring information collected thereafter that may help identify the relevance of various events and classes of events.

[0219] The subject may also change preferences to make rare exceptions to existing settings, or to apply the change to the settings throughout use of the client system going forward by manual keyed entry on a specified page or by verbalizing a command such as, “From now on, I want to know more about what causes me to be depressed,” or “I want to know, just now, when I am at my physical peak”. Such a change may prompt the client system to gather data around events that may help answer such questions. Events that might help answer the first question could be, for example, the instances in which the subject verbalizes to the client system such expressions as, “I feel depressed right now,” or, “I feel great,” or, the client system may monitor active sensory devices for markers indicative of depression, aiming to recognize any patterns through synthesis of the said data through the mining process **107**.

[0220] A sensory monitoring process (e.g. pulse readings from a pulse gauge) or a conscious monitoring process (e.g. inputs correlating to food consumption) may be programmed to attach metadata through a process such as an XML tagging to correlated user data in order to describe the nature of the user data, which may then be synthesized and processed **109** by the client system in a particular manner that is appropriate to the nature of the user data. Thus, these

categories (a sensory device may be associated with more than one category if it performs the functionalities related to a particular category) would provide the system with a means to differentiate the transmitted raw user data as relating to a particular life area, by which the mining process **107** would evaluate and deliver feedback to the appropriate life area in the client system interface **103**.

[0221] Depending upon the subject's inputs, the mining process **107** may generate and transmit instructions to the client system to deliver certain content through the client system interface **103**; content which may be observed by the subject and also provide trend readings, suggested remedial courses of action, or may display a prompt to the subject asking her or him to complete a certain task, in order to generate additional data points that the mining process **107** might evaluate.

[0222] Such prompts may involve asking the user to engage in a visual acuity test or playing an interactive image game (e.g. Adobe Flash; HTML5 to test cognitive functioning. In contrast, depending upon the client computer's built-in capabilities, the client system monitoring process may not require conscious input **101** by the subject at all (i.e. "passive input" **102**).

[0223] A handheld device may be equipped with, for example, gyroscopes that detect the number of footsteps that the subject takes over a period of time, or a camera, which may also exist in the type of a add-on sensory device **509** that enables the detection of the subject's heart rate and breathing rate, by recognizing small changes in the color of the subject's face and movement of the subject's chest.

[0224] Instead of a basic camera, a hands-free device may be equipped with visual sensory equipment and visual pattern-recognition software that both enable the detection of certain activities, such as when the subject is eating. In this example, the client system is able to skip the question, "What are you doing," and jump directly to the question, "What are you eating," unless the visual pattern-recognition software recognizes what the subject is eating, in which instance another question is skipped.

[0225] If the software is not reasonably confident about its reading, a prompt may be displayed to the subject through the client system interface **103** asking the subject to confirm whether or not the software's reading is correct, and the software may collect and store data about the subject's selection in the pattern-recognition software's application database to help

improve the accuracy of future pattern-recognition mappings to the correct selection.

[0226] Other examples of monitoring activities that could be performed through the use of the client computer's built-in capabilities are a hearing acuity test that produces low and high frequency sounds through the client computer's audio speaker or can detect low and high frequency sounds in the external environment through the client computer's microphone, and present a question or series of questions aimed at understanding to what extent the subject could discern the low and high frequency sounds. The presentation of such a test might depend upon whether the subject has indicated whether she or he has engaged in military combat or in another situation that could expose the subject to a harmful range and frequency of sounds.

[0227] The client computer could also be used to present, through the client system, a particular psychological test or questionnaire at an appropriate time that may be determined by the analysis of user data (i.e. the processing of user data through the mining process 107). For instance, an individual who has suffered a stroke in the past is at a much higher risk of post-traumatic stress disorder, and thus the client system might present, at a time when the subject might have a better opportunity to focus, a series of questions aimed at understanding whether the subject demonstrates markers indicative of the disorder.

[0228] When the client computer is capable of sensing the movement of the user's pupils and eyelids through a visual sensor such as a webcam 509 or a motion sensor, e.g. a hands-free mobile device incorporating a projection medium and user-facing visual sensor, which are positioned in front of the user's eyes and rest upon the bridge of the user's nose 505 or rest directly upon the cornea of the user's eyes 503, the client system could recognize whether or not the user has been looking at a computer screen, television screen, or other object that may cause damage to the user's eyes.

[0229] The front facing camera could detect the angle and/or distance of the object from the camera, and the pupil-facing sensor could detect the angle and /or distance of the user's pupils from the camera. By these measurements the user's line of vision with respect to the particular object could be detected, and the object could be recognized as a potential vision hazard such as a television or computer screen through visual recognition software.

[0230] The client system may then generate, and present to the user, feedback to communicate actions or behaviors to mitigate the risk of eye damage, such as suggesting that the

user direct her or his line of vision away from the object toward an object in the far distance for a certain time before returning her or his line of vision to the original object. Additionally, visual sensor directed at the user's pupils that is capable of recognizing certain light frequencies on the color spectrum may be used to detect certain conditions including jaundice. Alternately, a regular camera such as one on built-in to a handheld mobile computer may be directed at the user's pupils to perform the same task.

[0231] In the instance where a graphical interface **103** may be displayed through a medium that bisects some portion of the user's natural visual field, which may be worn on the user's body i.e. heads-up display, and where aspects of the user's visual field may be highlighted by content markers generated in real-time through the graphical interface **103** overlay as opportunities to provide relevant content are recognized through detection of visual patterns in the user's visual field by pattern-recognition software; these aspects might be possibly correlated to the user's interests through a mining process **107** in order to better ascertain relevancy of the said aspects.

[0232] Beyond the device's built-in processes is the expanded functionality afforded by add-on devices. Where such a hardware configuration capable of augmented reality display includes all of the aforementioned elements save for only a built-in microprocessor and/or physical memory storage and, thus, may need to be connected to a client computer which incorporates a microprocessor and/or physical memory storage, the hardware configuration capable of augmented reality may exist in the form of an "add-on device" that can be connected to the said client computer. In addition, any of the "built-in" processes of the various client computer configurations described in the preceding paragraphs may also exist in the form of add-on devices that may be connected with a client computer.

[0233] An add-on device, which may exist in the form of a sensory device, translate the objects and movements into data, and transmit data to the client system database **104** through a connection (e.g. Bluetooth radio built in to the subject's client computer forms a data link with add-on devices that have the same Bluetooth radio frequency, granted the client computer has the Bluetooth Advanced Programming Interface properly installed and configured on the device's operating system **113 114 115**).

[0234] The user data will then be transmitted from the client system database **104** to the

user database **106** provided that the client computer is connected to the Internet. From there, user data may be transmitted to the mining process database **108** following the application of appropriate data encryption protocols described in the preceding paragraphs. Depending upon the type of life event being monitored, the various add-on devices that may communicate with the client system may utilize unique mechanisms for sensing actions and objects, and translating those actions and objects into data.

[0235] An embodiment of the mining module **100** may provide for a means of interpreting data transmitted to the mining module **100** from multiple sensory devices (e.g. visual sensory equipment with motion detectors worn around the body) to better predict subject behaviors through algorithms which may correlate certain sensory data with certain activities.

[0236] Assuming, for example, that a subject is eating a piece of steak; visual sensory equipment may capture and map an image of the piece of steak to a table containing mapped objects, through which the client system may positively identify the piece of steak. Motion sensors worn around the wrists **507** may capture and map the detected motions to a table containing mapped motions, through which the client system may positively identify the act of eating. Taken in relation to one another through the means described above, the client system may positively identify the act of eating a piece of steak using multiple sources of sensory data.

[0237] For continuous monitoring of heart rate, a pulse gauge may be used. As the heart beats, an electrical signal is transmitted through the heart muscle in order for the heart to contract. This electrical activity can be detected through the skin. The transmitter part of the pulse gauge is placed on the skin around the area that the heart is beating, and picks up this signal. The transmitter then sends a signal containing the heart rate data to the client computer. A pulse gauge may be used to monitor a medical condition related to the heart, or it may be used as to monitor exertion during exercise or during the course of other normal life activities.

[0238] Heat sensors may also be worn around the body to detect fluctuations in body temperature, and to detect the temperature of the air circulating around the subject's body. Depending on how the subject performs, the feedback generated by such a device could help correlate heat sensitivity, which is a symptom of many latent medical conditions.

[0239] Motion sensors (e.g. accelerometers) may be worn around the body to sense the movement of the subject's arms and wrists **507**, or the expanding and retracting of the subject's

lungs, especially if it is worn over the chest, or embedded in an article of clothing covering the said area **508**. Motion sensors may also be incorporated into other objects capable of sensing body movements such as a pillow for sensing movements during sleep.

[0240] Motion sensors and electrical scales may be incorporated into the padding of shoes **516** to enable the detection of footsteps, the amount of force applied during movement and also to calculate changes in the subject's weight. An embodiment of a motion detecting device that incorporates a display and microprocessor is incorporated in a wrist band that contains a light-emitting projection medium which could project the display over bland surfaces including desks, pant legs and walls. The device may also incorporate visual sensors to detect manual inputs over the projected display. The client system interface **103** interactivity would follow the same form as for a handheld mobile device with a touch-sensitive display **502 510**.

[0241] Motion detection may also be enabled through the projection of an invisible force, such as an electromagnetic field, by a device that incorporates elements for detecting subtle changes in the field at any given point in time. The method utilized by this device for detecting such changes would depend upon the type of the field. For instance, a device that is capable of detecting heat might be used to identify the body temperature of a human. A device that is capable of detecting the size and location of objects, possibly by detecting deflected matter over a given area, might be used to identify the size and shape of a human, as well as other creatures and objects. A change over a given area, depending upon the characteristics of the identified change and its related movements, might be associated with a living creature such as a human through the mining process **107**. Through the same mining process **107**, such associations might be used to generate inferences and feedback for a particular user.

[0242] For monitoring changes in brain activity, an electroencephalogram (EEG) may be used. An EEG measures voltage fluctuations resulting from ionic current flows within the neurons of the brain through electrodes that are placed around the user's scalp. As the neurotransmission occurs, an electrical signal is transmitted through the user's brain which can be detected through the skin. The transmitter part of the EEG is placed on the skin around the area that the brain activity occurs, and detects this signal. The transmitter then transmits a signal containing the brain activity data to the client computer.

[0243] The electrodes of this device may be embedded in an article of clothing covering

portions of the head **504**. An article of clothing may be described as any apparatus that a human user can wear, such as a hat or eyeglasses. An EEG may used to monitor everyday life events such as work stress, happiness, and restlessness, or to monitor medical conditions including epilepsy, loss of consciousness or dementia, sleep disorders such as narcolepsy, and other physical (problems in the brain, spinal cord, or nervous system) or mental health problems.

[0244] The previous paragraph describes eyeglasses which incorporate EEG sensors. These EEG sensors may be embedded within the frame of the eyeglasses. The definition of eyeglasses may encompass any embodiment of a wearable apparatus incorporating an element to augment a user's field of vision that is positioned in front of the user's eyes, including a hands-free mobile device incorporating a projection medium and user-facing visual sensor **505** as described in the preceding paragraphs.

[0245] An alternative embodiment of eyeglasses may incorporate a means for connecting add-on devices through a computer bus (e.g. Universal Serial Bus). This computer bus may comprise of an input port (e.g. "female connector") that may be positioned at the center of the part of the eyeglass frame covering part of the user's forehead, by which an add-on device, such as an EEG device, equipped with a computer bus output port (e.g. "male connector"), could be connected to the eyeglasses.

[0246] The connection between the eyeglasses and EEG device would be established by manually aligning the computer bus output port of the EEG device with the computer bus input port of the eyeglasses and applying manual force in opposite directions between the eyeglasses and EEG device until the computer bus output port slides into the input port. The computer bus input port incorporated in the eyeglasses may be positioned either on the inside of the frame facing the user's forehead or, alternately, on the outside of the frame.

[0247] For monitoring blood-glucose levels, a glucometer **514** **514** may be used. A glucometer **514** measures the amount of sugar in a sample of blood by mixing it with glucose oxidase, which reacts with the glucose in the blood sample to create gluconic acid. Another chemical within a test strip, called ferricyanide, then reacts with the gluconic acid to create ferrocyanide. The electrode within the test strip then runs a current through the blood sample and the ferrocyanide influences this current in such a way that the concentration of blood-glucose within the sample can be accurately measured. The transmitter then sends a signal containing the

blood-glucose data to the main client system device computer.

[0248] Another embodiment incorporates same sensors in food containers used to detect prepared food contents including sugar levels 513, 515, and yet another embodiment performs various blood tests incorporating an area for replacing test strips for different types of tests, and an open-source advanced programming interface 103 through which researchers can program new logic into the device's computer by connecting it to an Internet-connected device and downloading the new logic.

[0249] Feedback may also include suggestions for products or services (i.e. marketplace process), help the subject identify and locate merchants where the subject may be able to purchase the suggested products and services, and compare prices between merchants. The basis for such feedback may be generated from data collected through passive, sensory inputs. A subject who listens to a musical production or consumes certain foods may transmit to an EEG device brain signals that may be correlated with human interest or pleasure.

[0250] In the example concerning food consumption, the order in which foods are consumed, the timing of the consumption of the particular foods in relation to the foods consumed before and after, the timing of the consumption of the foods in relation to the time of day, other biometric readings such as salivary secretions and pupil dialation, may be correlated with human interest or pleasure.

[0251] In any given example, the client system may then present to the subject various pages designed to present information that the subject may find useful in making a purchase decision. Data containing information about the purchase decision may then be transmitted to a third-party such as a practitioner, or, in the example of food consumption, a restaurant. In the example of food consumption, the selected item or items for purchase may present to the user some data that the user might find useful such as, in addition to the price of the product or service, nutrition facts and ingredients. The transmission of data to third-parties such as practitioners are described further in subsequent paragraphs.

[0252] The client system may detect which products or services the subject is viewing by collecting data about the subject's environment and activities through a combination of sensory devices and pattern-recognition algorithms. In the example concerning musical productions, the client system device configuration may capture the audio signals produced by the musical

production through a microphone sensor. The musical production may then be identified through the conversion of the audio captures into data by aural sensors on the microphone and audio recognition software that maps the data to the closest recognized patterns. These patterns may be defined in a database incorporating audio signals from musical productions.

[0253] The basis for such feedback may also be generated from data collected through conscious, deliberate inputs. The subject may perform a pre-defined action, such as verbalizing into a microphone or selecting from a menu using a manual pointer device, in order to communicate to the client system that the subject would like to identify a product or service. The client system may display to the subject a variety of options by which to identify the product or service.

[0254] One option may allow the user to deliberately produce audio signals into an audio sensor which may or may not precisely describe the product or service. In this instance, the client computer configuration would attempt to match the sounds produced by the subject to the products and services that most closely match the audio data collected from the subject through audio recognition software. This audio recognition software may incorporate algorithms which recognize patterns in the user's voice that are unique to the particular user, such as dialect and tone and, as more data is collected on the user's voice, adapt the additional data to the existing data to enable more precise recognition.

[0255] To facilitate the learning/adaptation process and enhance the accuracy of the audio recognition software, the software may provide the user with an option to complete a baseline audio test. This baseline test depicts, through text on a graphical interface **103** (e.g. "Say the word, 'apple'"), and/or audio signals through the audio output device (e.g. speakers; headphones) of the client computer configuration, words, musical notes and other sounds (e.g. the "E flat" musical note). The user is directed to attempt to replicate the words, musical notes, or other sounds depicted by the software by producing a corresponding audio signal (e.g. user attempts to say the word, "apple", or sing an "E flat") which may be detected by the audio input device (e.g. microphone sensor) of the client computer configuration.

[0256] In the example of a subject who is interested in identifying a musical production, the subject may select an option to match audio signals produced by the user to corresponding products and services. The audio signals produced by the user may comprise of, besides words

corresponding to the lyrics or title of the musical production, musical notes.

[0257] In this way, the subject may perform a search of musical productions by singing a song for which he/she has forgotten the title and artist. The audio recognition software may be able to map with better accuracy audio signals comprising sung lyrics and musical notes through the baseline test which would be able to detect imperfections in the user's recital of musical notes (e.g. where an "E flat" sung by the user consistently sounds like a "D").

[0258] A less accurate test may comprise of the user passively speaking into the microphone while the client system is running and capturing enough data on the various tones demonstrated by the user's voice to map the data to the closest recognized patterns in a database incorporating audio data correlating to various tones of speech which could help predict the relationship between the user's voice and the user's intended output.

[0259] In addition, the results produced by the user during these tests might be analyzed for dialect. The user might then be presented, through a query presented, either through a message consisting of text displayed on the client computer, or through an audible voice projected by the client computer, or both, with a series of phrases worded and inflected in different manners. This query would request that the user confirm which phrase she or he prefers, and the client system might subsequently display written messages and verbalize audio messages using the wording and tone preferred by the user.

[0260] Insofar as the present invention might have been assumed to only relate to user data collected from adults, the same logic for data collection and analysis, including the aforementioned audio recording and recognition processes, might also be applied in the same fashion in order to monitor children. A user might enable the monitoring of children by establishing the said user's account as a "custodial user" account which would process an option to create a "dependent subject" account that is accessed, viewed, and configured by the custodial user.

[0261] The mining process 107 would be capable of analyzing the correlation of behaviors and outcomes from child user data, and generating feedback from the analysis that may be pertinent to other children, as well as adults. This may implicate the inclusion of sensory devices with the same or similar functionality as the sensory devices described earlier, but whose design may be more suited to the shape and size of a child's anatomy.

[0262] A process for analyzing a child's speech patterns, and constructing a speech pattern that, through the client system and the client computer audio output, might be used to produce sounds to communicate with the child. The client system could then gather and analyze data about the reaction of the child to the audio output to incorporate improvements that could have a greater likelihood of producing the desired result when communicating with the child.

[0263] Because science may not yet have produced a reliable method of communicating with all children in general, the client system could start out employing the methods that have the highest likelihood of producing an intended result. For instance, the sound of another child's laughter may be much more likely to arouse playful feelings in a child who is awake and in need of attention. On the other hand, child laughter played while the child is crying could be perceived by the child as mocking or neglecting its needs, so a soothing lullaby could be played to put the child at ease.

[0264] In this situation, a "Walkie talkie"-type of audio data recording and transmitting system and apparatus could include a built-in computer terminal incorporating a microprocessor, RAM, data storage and display screen or be linked via Bluetooth or other near-field communication protocol to such a computer terminal device. Or, the client computer configuration with built-in microphone might be used.

[0265] In any instance, child's sounds are captured through an audio sensor. The audio signals may then be identified with various forms of distress (e.g. hunger; teething; need for attention) or placidness, by converting the audio captures into data and mapping the data to the closest recognized patterns in a database incorporating audio data correlating to various forms of child distress and placidness.

[0266] An option for an adult (in this instance, the custodial user) to rate the accuracy of the feedback generated from the client system would provide the mining process 107 with additional datapoints which could be associated audio data inputs of certain common characteristics. Thus, a negative rating may cause the mining process 107 to gather feedback from the next most-closely mapped assessment, and a positive feedback may reinforce the previous decision of the mining process 107 and produce similar results upon the next occurrence of similar audio inputs.

[0267] Here, a baseline test could also be used to better predict the child's emotions, by

having an adult indicate which emotion he/she believes the child is communicating, although the adult's feedback could also skew the results if the adult's perceptions of the child's emotions are inaccurate.

[0268] Alternately, the baseline test may comprise of listening to the child and having the adult record which actions resulted in a positive response from the child. For instance, if the child is crying, and the adult feeds the child and it is still crying, the adult may record their experience by responding to a questionnaire generated by the client system. Based on the adult's responses to the said questionnaire, a follow-up questionnaire may be generated by the client system and presented to the adult, which may include a query about whether the child is rubbing or opening and closing her or his mouth, and/or chewing on anything.

[0269] The client system may also present suggestions to the adult, which may be based on the responses to questionnaires and/or other user data, and which may include an instruction to provide a pacifier to the child. The suggestion may be provided in the form of a simulated human voice generated by the client system and projected through a system and apparatus for projecting sounds such as one incorporated in a client computer (e.g. speakers on a mobile computer).

[0270] This voice may provide the suggestion in the form of a direct instruction and/or may reflect the inferences about the child's state that were determined by the client system, such that the voice would simulate what the child might say if she or he could talk. The effectiveness of such suggestions may be hypothesized by the client system may include the analysis of user data collected from, both, the child as well as the adult.

[0271] Such findings may result in the predicted likelihood of effectiveness of the suggestions, which may be used to correlate inputs with inferences from which future suggestions could be logically extracted (such as, based on the previous examples, the likelihood that the child is teething and that a pacifier will comfort the child). Such inputs may include certain sensory inputs, such as recorded audio from an audio sensor directed at the child, motion detections from sensory devices worn by the child, motion detections from a visual sensor such as a video camera directed at the child, electrical signals transmitted through the child's brain or heart as detected by a pulse gauge or an EEG worn by the child, amongst other readings from various types of sensory devices, as well as conscious inputs 101 from an adult.

[0272] All of the above-described processes may be encompassed in an embodiment wherein the device used to record the child's voice takes the form of a handset or wearable medium suited to the form child's body. This device may incorporate wireless technology (e.g. near-field communication) such that the device is able to transmit the recorded data to an Internet-connected device such as a workstation and/or smart mobile device. Furthermore, this device may incorporate wireless technology (e.g. wireless network adapter) such that the device is able to transmit the recorded data to a wireless network access point such as a modem.

[0273] In any instance, the recorded data is directed, through the Internet connection, at the destination of a remote server. From this remote server, the recorded data may be accessed from a module **100** and/or plug-in that may be downloaded on a plurality of client computers including the custodial user's smart mobile device and workstation. Alternately, if the custodial user does not wish to transmit the data to a remote server and has downloaded the mining process **107** and user database **106** to her or his client computer, she or he could configure the recording device, when it incorporates near-field communication, to transmit the recorded data to only certain client computers that are within the required range for receiving the data.

[0274] The module **100** and/or plug-in for receiving the recorded data may be configured to download a log of all of the inferences about the recordings generated by the mining process **107**. Each log entry would display some metadata such as the date, time, priority and truncated description of the inference. By selecting a log entry through her or his client computer, the custodial user would be able to access the entirety of the log contents including the full description of the inference, the basis of the inference, and the recording itself. The custodial user would also be provided with opportunities to rate the accuracy of and direct feedback at the inferences generated by the mining process **107**.

[0275] The module **100** and/or plug-in for receiving the recorded data may also be configured to, either, stream the recordings in real-time by, at any given time that the functionality is desired, selecting a certain option to check up on the child via live streaming, or to only stream recordings that have been identified by the mining process **107** as being characterized by a certain priority level. The basis for the mining process **107** to apply the appropriate priority levels to various recordings could be manually configured by the custodial user.

[0276] The basis for the mining process **107** to apply the appropriate priority levels to various recordings could also be configured automatically by the client system through inferences generated from an analysis of the custodial user's user data about her or his most probable preferences for this configuration. In this instance, the custodial user would first have to configure the client system to automatically configure the basis for applying the appropriate priority levels to various recordings.

[0277] Thus, different priority levels might be applied to different recordings based on inferences generated by the mining process **107** about the content of the recordings. For instance, the module **100** and/or plug-in for receiving the recorded data may be configured to only mark as highest priority instances where mining process **107** infers that the child is crying because it is in pain, hungry, or otherwise in urgent need. Furthermore, the module **100** and/or plug-in for receiving the recorded data may further be configured to only mark as an intermediate priority (neither the highest nor lowest priority) instances where mining process **107** infers that the child is being noisy because it wants attention or is bored.

[0278] Based on the level of priority, the recording may be presented to the custodial user in a different manner. For instance, recordings marked as highest priority might be configured to stream in real-time upon the custodial user's client computer while intermediate priority recordings might be configured to send a text message or alert to the custodial user's client computer.

[0279] In addition to children, such an audio process that correlates emotions with the tone of an individual's voice could be used in the instance of an adult, except that, in that particular instance, the adult voices would be mapped to a database of adult voice sounds, and a baseline test which requests that the user reproduce certain sounds correlated to certain emotions could be used by the client system to establish the tone of the adult's voice in certain situations.

[0280] Alternately, the client system may query the user on their emotional state during the course of the day if the client computer is configured to continuously capture audio data, where the query may be triggered by a change in the user's normal tone which may indicate a fluctuation in emotion. Likewise, the user's response could be used by the client system to correlate, with greater confidence, characteristics identified from the user's voice, to certain emotions.

[0281] Also, in each of the examples above, incorporating a child and an adult, which are provided to expound upon the said audio process, an EEG could be used in tandem with the voice captures to, through the mining process 107, predict the user's emotional state. For instance, a certain brain signal could be correlated with certain emotional states to a certain degree of likelihood; a degree of likelihood which may also consider other data gathered around the event coinciding with the occurrence of the identified brain signal pattern. The basis for such predictions may thus be incorporated within a data processing model by which brain signals could be together considered with audio signals in mapping events to inferences; inferences, which this instance, pertain to the user's emotions, but may also describe other areas.

[0282] The mining process 107 may also make use of other types of sensors for collecting data about the child to be incorporated in the mining process 107. For instance, a motion sensor or a video camera might provide a basis for the mining process 107 to infer that the child is attempting to climb out of its crib, mark the recording as high priority, and enable the custodial user upon her or his client computer to stream in real-time the video recording.

[0283] Going further, the same logic for data recording and analysis, including audio recording and recognition might also be applied to monitor other types of human users, such as individuals with speech disabilities or for formal human research subjects (i.e. dependent subjects). In the instance of a formal research subject, in addition to the aforementioned benefits, the investigator may want to use sensory devices to more closely monitor the subject's condition and obtain additional datapoints to substantiate her or his research.

[0284] Going even further, the same logic for data recording and analysis, including audio recording and recognition might also be applied to monitor various creatures. Having established the usefulness of an embodiment of the present invention wherein non-human-type users are involved, any reference to a subject throughout this description may also refer to any creature including a veterinary subject.

[0285] In the instance of a house pet, an owner may want to be better able to understand, communicate with and understand the needs of her or his pet. The mining process 107 would be capable of analyzing the correlation between various events and circumstances from the living being's user data, and generating feedback from the analysis that may be pertinent to other living beings, as well as humans.

[0286] As in the processes described pertaining to humans, the client system may incrementally develop new knowledge of the subject's condition ("subject", in this instance, describing any living being) based on the inputs created by monitoring that particular subject as well as other subjects from which user data is available. This new knowledge could then be applied to new feedback which is delivered to humans.

[0287] This may implicate the inclusion of sensory devices with the same or similar functionality as the sensory devices described earlier, but whose design may be more suited to the shape and size of the living being's anatomy, such as a collar worn around the neck of the living being that processes sensors for detecting the living being's heart rate, body temperature and movements.

[0288] Also implicated may be the inclusion of a process to analyze the living being's speech patterns (if they are audible) in addition to other communication indicators and develop a speech pattern which could be used to communicate with the living being through the client system and the client computer audio output. The client system could then gather and analyze data about the reaction of the living being to the audio output to incorporate improvements that could have a greater likelihood of producing the desired result when communicating with the living being. Because science may not yet have produced a reliable method of communicating with the particular species or breed, the client system could start out employing the methods that have the highest likelihood of producing an intended result.

[0289] For instance, the client system may play the sound of a human voice at an audio frequency and in a speech pattern that attempts to mimic that of its owner based on an analysis of a recording of the voice of the living being's owner, employing a verbal command that was detected as possibly producing a certain desired effect. Alternately, the client system may record and then playback an actual recording of a certain communication by the owner to the living being that produced a certain desired effect. The client system may also be capable of recording communication between living beings and replaying an actual or simulated recording that was detected by the client system as possibly producing a certain desired effect, such as, for instance, hearing another kitten's purr having a placating effect on the owner's kitten.

[0290] Based on analyses of the subject's condition and behavior patterns under a certain set of circumstances over time, the client system might correlate a certain combination of inputs

relating to that particular set of circumstances into an expected behavior that could be translated into a verbal (audio or text) message that could be communicated to a human adult user (i.e. a “custodial user”). This message could be communicated to the custodial user through the client system interface 103 employed by the custodial user.

[0291] Alternately, the message could be communicated to the custodial user through a sensory device that may be worn by the living being. This device may be equipped with the functionality of a client computer sufficient to record and analyze the living being through any of the standard means described above, and effectively deliver the message to the custodial user.

[0292] The suggestion may be provided in the form of a simulated human voice generated by the client system and projected through a system and apparatus for projecting sounds such as one incorporated in a client computer (e.g. speakers on a mobile computer). This voice may provide the suggestion in the form of a direct instruction and/or may reflect the inferences about the living being’s state that were determined by the client system, such that the voice would simulate what the living being might say if it could talk. The wearable sensory device could be equipped with the functionality of a client computer either by having the related technology (i.e. microprocessor, memory) physically built-in to the sensory device, or by establishing a two-way communication (i.e. Bluetooth) with such a device.

[0293] In order to establish two-way communication, the sensory device might be configured to, whenever in range of the sensory device’s built-in wireless communication capability, automatically connect to a computer with a microprocessor, memory, storage, and any other elements necessary to activate the relevant monitoring processes incorporated in the client system. This computer to which the device is connected could be a home computer or the client computer used by the client system human adult user, such as a smart phone. The sensory device, if equipped with a video or audio output, could then be capable of displaying the text or voicing the audio message produced by the client system running on the computer to which the device is connected.

[0294] Such processes could also be helpful where the subject has trouble with or is incapable of communicating with a human user and also incapable of operating the client system on her or his own (i.e. a “dependent subject”). For instance, a child crying in a certain way may be associated with hunger due to the child reliably ceasing to cry in this way upon feeding in the

past. Thus, when the child cries in this way, the client system may communicate to the adult user, either through the client computer interface **103**, or through a sensory device akin to the one described in previous paragraphs that would conform to a child's anatomy and be worn by the child, a message akin to, "I'm hungry."

[0295] The client system may also associate cries having certain other characteristics with different messages, not only based on responses from the child but also lack of responses and circumstantial data such as the child's age. For instance, if the child is at the age of teething and feeding does not remedy the child's crying, a certain type of cry may be associated with teething to a degree of certainty. Thus, upon detecting the child's cry, the client system may communicate a message to the adult user akin to, "I'm in pain," or "Please give me my pacifier." A positive response to the pacifier could then reinforce the logic of the particular cry with certain characteristics being indicative of teething.

[0296] In order for a user of the client system to establish her or himself as a guardian of a dependent subject, the user may do so by proving certain inputs during the initial registration process, or by accessing a page wherein the user may further customize her or his account after it has been established. Upon indicating guardianship, the client system may display a page or series of pages on the client system interface **103** featuring content such as a questionnaire aimed at gathering background data on the dependent subject.

[0297] In order to form a valid connection with the particular dependent subject by which user data can be sent between the sensory devices worn by the subject and the guardian's client system, the guardian may use her or his client computer's built-in capabilities to obtain evidence of some unique characteristic that could be used to identify the particular subject and potentially prevent others from invalidly connecting to the same subject's sensory device, or from associating user data with the wrong subject by inadvertently placing the same sensory devices on a different subject.

[0298] For instance, the guardian might record a short video of the subject that could then be used to validate the identity of the subject whenever the subject is in view of the client computer's visual recording capabilities by recognizing the particular sensory device associated with the subject, recording images of the subject, mapping those images to the previously-recorded images of the subject and using the visual recognition capabilities of the client system

to determine the correlation.

[0299] This result may then be communicated to the guardian, along with any other guardians associated with the sensory devices, through a page on the client system interface 103. The guardian who established the initial connection with the dependent subject might be able to, from this page, remove other guardians associated with the sensory devices.

[0300] Two or more users (e.g. close friends) who share some time interacting with each other may also form a connection to share either share all user data in a particular life area or to only share certain user data (e.g. when the particular users are interacting with each other). Users who have chosen to share all user data in a particular area may choose to share their exercise results (perhaps for motivational reasons), or their emotional states (to alert the other user if one is having a bad day, or to let one user know that the other are having a good day), among any other life area, or all of them combined.

[0301] Users who have chosen to share only some user data may allow sharing of all user data in a particular life area or areas when a certain condition is met (e.g. both users are at home or within a certain distance of each other). Alternately, the sharing of user data may pertain to a particular one-time event, such as an important meeting or a sporting event.

[0302] A user who is established as a close connection may also submit a request to the other user asking that the other user share certain user data (the processes pertaining to the establishment of connections with other users are further described in subsequent paragraphs). The client system, if so configured by a particular user, may generate and display suggestions to another user, who is connected to the particular user, of life areas of the particular user that the other user might be interested in, to encourage the other user to request potentially mutually-beneficial sharing of the particular user's data. Monitoring information that is permitted by and obtained from a particular user that is pertinent to the other user may be displayed in the other user's "Notifications" page in the client system interface 103.

[0303] For example, a spouse and husband who are connected in this manner may select an option within the client system to receive a notification whenever the other connection is feeling unusually stressed, with general stress level and the user's specific stress threshold being determined from a number of factors, including conscious inputs 101, passive sensory readings such as pulse gauge and EEG readings, past related events and experiences, and the user's ratings

on past feedback. One connected user (e.g. spouse or husband) may then request feedback on the appropriate behavior or action that she or he should take pertaining to the other connected user (e.g. husband or spouse), such as encouraging her or him to rest or to seek medical attention immediately in more severe instances.

[0304] The ability for a plurality of subjects to share their respective user data with each other may be further useful in identifying genetic traits amongst a population of individuals who share a distinguishable and/or direct hereditary link and relaying the implications of certain traits identified to the affected subjects.

[0305] Genetic factors may be assessed through the processing of user data through the mining process 107; user data which may include results obtained from blood tests or from DNA testing services which generate a profile of the user's DNA based on a specimen sample. The mining process 107 could then process the user data to generate a risk profile that calculates the probability of traits expressed in the subject.

[0306] These traits include interests and activities that the user might enjoy, as well as medical conditions in instances wherein genetic testing predisposes the subject to certain medical conditions. Here, the mining process 107 could include in the risk profile generated by the mining process 107 the probability that such conditions could be inherited by the subject (bearing in mind that subject may have the ability to exclude such information in the monitoring process).

[0307] Genetic factors may be further assessed through the analysis of data pertaining to individuals who share a distinguishable and/or direct hereditary link to the user (i.e. a family member). This data may be input consciously or shared from another services such as an independently-developed solution, or, if the subject's family members are also users of the client system engaged in the monitoring process (i.e. subjects), the said subject may have the option to form connections with family members to further define traits pertaining to the subject's personality as well as further predict the risk of disorders or undesirable outcomes, by which suggested behaviors might be identified and fed back to the subject in order to mitigate the risk of triggering medical disorders and other undesirable outcomes.

[0308] This option may be enabled through selection(s) and/or input(s), by one or more family members through the client system, identifying the accounts and describing the hereditary

relationship(s) pertaining to one or more family members. The user data sets of the respective family members who have enabled this option may be compared with, and evaluated in respect to, each other through the mining process 107 in order to generate the results described above which are fed back to the family members through the client system.

[0309] For example, a subject, who may form such connections with a plurality of family members who each have a history of a psychological condition, if the subject has not already been diagnosed, may receive feedback through the client system pertaining to her or his risk of the condition, without any disclosure of the medical diagnoses pertaining to her or his family members.

[0310] This feedback may be based on an analysis of the behavior patterns of family members identified from their user data that may or may not be recognized as an expression of condition, and comparison of such to the behavior patterns of the particular subject. In the event that the subject begins to exhibit those behaviors attributed to condition in the instances of her or his family members, the client system might generate, and transmit to the affected subject, feedback in the form of a direct indication, or, alternately, suggested behaviors to mitigate the risk of triggering the condition.

[0311] Depending upon the type of user seeking to benefit from use of the client system, a different version of the client system may be appropriate. A version of the client system might display content and offer standard configurations of the client system that differ from another version. For instance, a kid-friendly version of the client system may be available for children, or for parents to encourage their children to use, as a healthier alternative to other multimedia-based activities. Furthermore, the parent might be able to connect to the child by forming a link between the parent's guardian account and the child's account. The guardian account would then be able to monitor the child as a dependent subject, by which it may also be availed to the processes availed to practitioner accounts such as a medical advisors (further described in subsequent paragraphs).

[0312] Where any version of the client system may incorporate interactive games appropriate to the skill level of a particular user, which may be played by the said user in order to collect user data that may be helpful in drawing inferences about the state of the user's cognitive functioning, a kid-friendly version of the client system may also present monitoring

questionnaires in the form of games, where the user may earn rewards including fictional money that could be exchanged for a selection of goods and/or services through the client system.

[0313] These rewards could include unlocking new games, levels within a game, characters within a game, or abilities for a certain character in a game. Granted, a user who is a child may not be a proficient reader, so the user may have the ability to select from a list of cartoon characters and voices to pair the characters with; characters, who would be displayed on the client system interface 103 with movements in sync with the characters' verbalizing of the questions to the user, which the user would be able to hear through the client computer's audio synthesizing and/or projecting capabilities.

[0314] The activities related to various interactions, including the performance of certain actions that could satisfy goals and consequently generate rewards, with the client system may also be presented as a game in and of itself, which can be activated and deactivated and, which, when activated, may generate and present additional and/or altered elements within the client system interface 103 related to the execution of the game. The composition and nature of the said elements within the client system interface 103 might vary according to the type of client computer running the client system through which the game is activated.

[0315] For instance, when a user is running the client system on a hands-free mobile type of client computer with the ability to record, and project upon the user's display, imagery capturing the user's visual field in real-time upon which graphical elements may be overlaid to produce an "augmented reality" effect as described in earlier paragraphs, the additional and/or altered elements within the client system interface 103 that are generated through the activation of this "gamification" process may include overlaid: text indicators such as reminders of outstanding goals, statistics for monitoring the completion of goals and accumulated "points" which may be used to purchase rewards; objects related to various "side games" such as moving targets that the user attempts to connect with by pointing and depressing a button incorporated in a remote control device that is connected to the client computer via near field communication, or by simply aiming her or his finger at the object within her or his line of vision where it could be detected and mapped by the client computer and performing a pre-defined command that corresponds to the shooting action; animated characters that may challenge the user to various "side games" as well as verbalize the said text indicators in personalized messages aimed at

encouraging the user to further complete goals, or characters who, themselves, are incorporated in a side game, such as one wherein the user is challenged to pass a ball to moving target characters that may be represented as professional athletes.

[0316] These “side games”, as well as the characters incorporated in the side games, may be toggled and selected, either, consciously by the user, as well as, through an analysis of the user’s user data that could simulate either the user’s selections and/or the most beneficial selections to the user, by the client system. In the latter instance, if an analysis performed by the client system incorporating the user’s user data infers that the user’s ability to focus is impaired or declining, the client system may, under certain circumstances, present the user with a side game that focuses on improving cognitive functioning in the area of focus and attention.

[0317] The scope and depth of such games may span one focus area that engages the user for a few seconds to a “virtual reality” wherein a particular side game is ever-present, such as a fantasy-type game aimed at increasing physical activity, imagination and awareness, wherein the user assumes the role of a character and, at various opportune times such as when the user is idle, present the on-screen elements that immerse the user in the virtual realm whereby she or he may engage in various forms of combat with villains, upgrade their in-game resources such as weaponry, armor and vitality, and reach goals such as completing stages and rescuing certain allies. Such “side games” may also be played concomitantly with other users who are in physically remote locations, by displaying an animated avatar that corresponds to each particular remote user’s in-game character and mimics the said user’s actions and movements with respect to playing the game.

[0318] In addition to various processes of the client system involving two or more individuals sharing information through a single account, or accounts each, registered as a “subject”, the client system may also be registered to other types of users, whose own use for the client system may extend beyond the processes described previously, and thus require a version of the client system that is configured differently, and incorporates content that is different, from the version of the client system that is utilized by other types of users; different content and configurations by which additional unique processes for collecting and/or sharing information may be accessed that are relevant to the particular type of user.

[0319] An electronic marketplace process within the client system, such as the one

described previously, from which a user may purchase goods and services, may incorporate a means for merchants to register and receive feedback (e.g. how many users are recommended to the merchant's product; how many times the merchant's product is liked by users; how often sales are converted on products that are recommended or liked; etc.). The feedback might help a merchant decide to what extent it orients itself in this marketplace process, as in an example where the merchant may accept a type of electronic currency such as one tendered by the service provider responsible for the mining module **100** or researcher, or, alternately, from an insurance provider.

[0320] It may also be possible for an insurance provider to register for and use the client system. The functionality of an insurance provider account might be limited to connecting with a particular subject to monitor usage of the client system, which may facilitate a determination on a benefit such as a discount on premiums to be rendered to the subject. To that end, the mining process **107** may provide additional feedback by comparing the health status of people with a certain set of biological factors and a certain amount of usage of the client system, with people with the same or similar set of biological factors who do not use the client system, and assigning a monetary value to the predicted improvements to long-term health produced through use of the client system.

[0321] In addition, if a subject is enrolled in a research study, the researcher may desire in order to indicate the value of a subject's participation and/or to work on a deal to compensate the subject through insurance premium reductions. The researcher may contact the insurance provider through a means provided by the client system by which the researcher could send a message to the particular insurance provider.

[0322] It may also be possible for users to access a process within the client system wherein the user may be able to provide information about a particular insurance provider and/or a particular healthcare provider (e.g. individual insurance-related costs and/or individual medical service costs). Users may then have the option to submit a query through a database of insurance providers and/or healthcare providers, searching by a set of parameters which may include service costs and customer ratings.

[0323] Furthermore, a means may be provided for a practitioner to register for and use the client system. In the embodiment described hereafter, a practitioner refers to some external

party that may be an individual or organization seeking to conduct research (hereafter referred to as “researcher”), an individual healthcare provider seeking to monitor patients (hereafter referred to as “medical advisor”) or a healthcare facility with the ability to verify records of patients. The terms “researcher”, “medical advisor” and “healthcare facility” are used as examples for the purpose of describing a particular embodiment of the present invention and may, otherwise, be described as any general user and/or may be used interchangeably.

[0324] A subject may connect with researchers by, for instance, responding to research request listings, which are displayed on a designated page. A connection formed with a researcher may allow the subject to see who the researcher is, but not vice versa. A medical advisor may view a page displaying a passkey specific to her or him at the time the registration process is completed. The subject might then connect with a particular medical advisor by entering, in a designated input field, a passkey which corresponds to the same medical advisor. A healthcare facility may confirm a passkey specific to itself at the time the registration process is completed. The subject might then connect with a particular healthcare facility by entering, in a designated input field, a passkey which corresponds to the same healthcare facility.

[0325] The process for a practitioner to register for and use the client system begins when the client system is run, and the practitioner chooses the option to register as a practitioner **201**. By choosing the option to register as a practitioner, a unique set of registration fields are displayed relating to the practitioner, including fields for indicating whether the practitioner is a researcher, medical advisor or healthcare facility.

[0326] For a practitioner requiring an identification key to proceed with the registration process, the client system conducts a database search for the practitioner's identification key. If validated, the practitioner is able to proceed with the registration process. Otherwise, an error prompt would be displayed on the registration page indicating that the practitioner is not recognized.

[0327] A practitioner who is registering as a medical advisor may need to enter her or his medical license number which could be validated against a list of board-certified doctors. A medical advisor may not be required to possess an identification key in order to register, but may be provided one at the end of the registration process which could, then, in turn, be provided to the patients. The identification key could be used by patients to validate the medical advisor's

identity and credentials, prior to granting permissions to the said medical advisor that would enable the medical advisor to access and view her or his user information, including feedback generated by the client system.,

[0328] A user seeking to register as a healthcare facility may be provided a valid means of proving that the facility is licensed or certified by the applicable state board of medicine. Since the list of licensed or certified healthcare facilities, along with the corresponding addresses, may be available to the public, the service provider of the client system may send physical mailings to the addresses of all healthcare facilities disclosed within the list of licensed or certified healthcare facilities.

[0329] Each of these mailings would disclose a randomly-generated identification key that is assigned to the addressee. The healthcare facility would enter the identification key, which is disclosed in the mailing, into a designated input field during the registration process. The healthcare facility could then be able to validate requests to enroll in research studies by subjects, who are patients of the same healthcare facility, by confirming the identities of the subjects and any preconditions required for the subject to participate in the studies.

[0330] To prevent a healthcare facility from disclosing the subject's personally-identifiable information at any time to the researcher, the healthcare facility might read and electronically sign an agreement to preserve all personally-identifiable information related to a subject in any matters pertaining to a research study, including any communication with the researcher.

[0331] In order for a user to register as a researcher, a link might direct the researcher to contact the service provider of the client system. The service provider, upon agreeing to terms with and approving the researcher, could provide the researcher with an identification key, which the researcher could enter in an input field appearing on the client system interface 103 on the display pages corresponding to the registration of a researcher.

[0332] When a registration form has been appropriately completed and submitted for a user that is a researcher, a second set of inputs is displayed to collect information about the researcher's research requests, consideration to be tendered to subjects, and information about the account from which consideration may be withdrawn from the researcher.

[0333] The type of account from which consideration may be drawn may depend upon

type of consideration being tendered; consideration which may comprise any legally-acceptable form of consideration, including legal tender or virtual currency, and as such may be established with a bank account, electronic currency account (e.g. Bitcoin), or independently-developed escrow service account (i.e. PayPal), among other types.

[0334] In an alternative embodiment, the subject may receive, in exchange for their participation in a research study, a form of consideration directly from the service provider responsible for the mining module **100** which may include electronic currency, or “points”, that, for example, might be spent on goods and services to be provided by the said service provider and/or from partners of the said service provider.

[0335] With reference to FIGS. 3 and 4 depicting, respectively and in accordance with some embodiments of the present invention, first, the flow of data between the mining module **100** and external parties, and second, the authentication process for the enrollment of research subjects **400**; after submitting her or his information, the researcher may be assigned a researcher serial number and is able to post additional research requests **401**, view the number of requests that have been fulfilled, and view anonymized (i.e. conceals personally-identifiable information of the monitoring subject) data from subjects who have agreed to share their information.

[0336] The research requests may be stored on a separate research database **116** on a mainframe computer. Information from this database is transmitted over a connection to the Internet to the client system to be displayed on the subject's and researcher's interfaces **103** in relevant areas, including a page where the subject and researcher can browse through listings of research requests. From this page, the researcher may view and edit their own research request information, and search the user database **106** of subjects with certain characteristics to view anonymized wellness profiles of potential research subjects who have indicated that they are open to receiving solicitations for the type of research studies that the researcher is conducting.

[0337] Wellness profiles may be embodied in a summary of activities recorded by the client system. This summary may present a table of various life activities and/or life areas based upon the inherent characteristics of each life activity or area. Numerical values corresponding to each activity and/or life area may also be presented in an attempt to quantify the various activities and/or areas. These values may change in real-time to adapt to the ongoing life activities of the user that are detected by the client system. A wellness profile may also be used

by a user as a tool for managing various aspects of their lives by listing for the user a list of the activities that she or he has carried out, characterizing and organizing her or his activities into categories of activities (i.e. life areas), comparing the activities that the user has carried out to the activities that she or he has planned to carry out, and even aggregating the numerical values of activities comprising the various life areas in the format of a balance sheet or a statement of changes in balances.

[0338] In that vein, an asset might represent something to be consumed, used or expended in the future (e.g. calories consumed that can be expended on various activities), a liability might represent an expectation of future consumption, use or expenditure (e.g. exercise expected for day – I am liable for performing xyz exercise at these times in the future), an expense might represent an expenditure over a period of time (e.g. calories spent/expended on certain activities – i.e. studying expenditure) and revenue might represent assets gained (e.g. calories consumed/energy gained from consumption of assets).

[0339] Upon viewing the requirements of a particular study, the subject may be presented with an outline of the particular monitoring areas targeted. The monitoring processs that are built-in to the client system could then be automatically enabled upon agreeing to the study requirements. Alternately, in an embodiment wherein user data is transmitted from independently-developed solutions to the processes described in this present invention, the subject may be presented with a combination of independently-developed solutions that the subject could install and use to monitor the areas incorporated in the study 301, wherein the process of sharing user data with researchers could remain the same 303.

[0340] Prior to engaging in the study, if the process has not already been completed, the subject would need to provide a means to validate that the name on the account belongs to a real person (e.g. by providing a credit card under the corresponding name) in order to prevent fraud. When a subject applies to engage in a study, the subject agrees that that they meet the preconditions specified in the research study terms by reading the provided text relating to the study terms and completing the appropriate action for indicating her or his consent and agreement 403.

[0341] In instances where the researcher has chosen to allow certain research candidates to respond to a research request even if certain requirements of the study are not indicated within

the candidate's profile, prior to enrollment, a survey may be displayed to the subject to answer the pertinent questions related to the study requirements that are not answered in the subject's profile.

[0342] The subject may also in this process identify a healthcare facility that can confirm that the subject meets the preconditions outlined in the research study terms. The subject may perform a basic keyword search on her or his healthcare facility from a database of healthcare facilities, in order to be presented with a list of options that most closely match the subject's search terms.

[0343] For those facilities that have already been registered, the subject would be able to select the healthcare facility and proceed with the research study enrollment process. Otherwise, the healthcare facility would need to register to validate the subject in order for the subject to participate in the research study **402**. When the subject selects a registered healthcare facility, an automated message is sent to the healthcare facility at the email address that the same healthcare facility provided during its registration process **404**.

[0344] Someone at the healthcare facility reads the email, logs in to the client system and views the subject's name as well as the conditions that the subject is required to meet in order to participate in the study. The person at the healthcare facility either confirms or rejects that the subject is a patient of the same healthcare facility and that the subject's agreement to the research study terms would be valid on the basis of fulfilling the requirements **405**.

[0345] If the subject's request is rejected by the healthcare facility, the subject is sent an electronic message indicating that their request was rejected by the healthcare facility. If the subject's request was accepted by the healthcare facility, the subject is sent an electronic message indicating that their request was accepted by the healthcare facility, and that the subject may engage in the study **406**.

[0346] Provided the subject's agreement to proceed with enrollment in the study, the agreed-upon fee is withdrawn from the researcher's account and held in an online "escrow" account until the subject has fulfilled the requirements of the study. The escrow service holds money on behalf of transacting parties, which could be a functionality that is integrated into the interface **103** of the client system, or could also exist as an independently-developed "escrow" service (e.g. PayPal). As the study is being completed, the researcher may able to view the

subject's anonymized user data in real-time, or download a spreadsheet of the subject's aggregated user data at any point during the study. Upon completion of the study requirements, the agreed-upon compensation is transferred anonymously from the researcher to the subject.

[0347] In order to prevent providing a means to the researcher to personally-identify the subject, the funds may be first transferred to the escrow service provider which then transfers the funds to the subject so that the researcher is not able to identify the payee. The subject may also choose to terminate an agreement early or otherwise fail to fulfill its requirements, in which instance the researcher's funds which were held in "escrow" are returned to the researcher, and the researcher maintains possession of the anonymized data provided by the subject.

[0348] The integrity of the researcher's study may be protected from subjects setting up multiple accounts by requiring entry of bank account information for every subject who seeks to participate in a research study. An automated database lookup and comparison functionality is executed at the time of bank account information entry by a subject, which confirms that entered bank account information does not match to bank account information corresponding to preexisting subjects.

[0349] If a matching, pre-existing bank account is identified, the subject is denied the ability to set up or participate in a study until information corresponding to a unique, valid bank account is entered. In addition, when the researcher is setting up a research study request, the system will proffer suggestions of minimal requirements to include in the research study request to curtail the risk of fraudulent reporting by subjects.

[0350] While viewing research requests, subjects may be provided an option to post offers or counteroffers to the researcher's suggested payment amount ("willing to pay" amount) for the fulfillment of the request, since the researcher has an incentive to price low and undercut the subject's potential reward. Subjects may also have the option to identify the amount they believe the data corresponding to a particular life area is worth ("asking price" amount) in a text box or menu on the same page where all selected monitoring areas are listed.

[0351] This process might benefit the subject where there exists a circumstance in the subject's user data that might make their information more valuable to researchers. A statistic generated by an algorithm coded into the client system, which correlates transaction prices for previous research recruitments with certain study requirements (which include the transmission

of certain user data), may be displayed to the subject to show the amount researchers might currently be willing to pay for the said data (i.e. dynamic pricing).

[0352] The asking price becomes useful to researchers when they post a request and indicate the profile of their ideal candidates. Here, in order to provide the researcher with information to make an informed decision about their offer, a statistic generated by an algorithm coded into the mining module **100** that correlates transaction prices for previous research recruitments may be displayed to the researcher indicating the amount that a certain number of subjects with a particular set of circumstances in their profiles have asked for to enroll in research studies with certain requirements.

[0353] Furthermore, subjects, if they select an option displayed from the client system interface **103**, may be automatically matched to a request when their asking price meets the price that the researcher is willing to pay. The subject may then view and agree to the terms of research requests that she or he has been automatically been matched to.

[0354] It might be necessary for the researcher to obtain additional information to validate the activities of the subject. In this instance, the client system may ask, at intervals of time that may either be defined by certain parameters or at random, the subject for additional information or data such as a picture or video to evidence that the events indicated by the subject's monitoring activity are actually taking place.

[0355] Research requests may include information from monitoring activities, or other non-personally identifiable data, which may also be retrieved from the subject's social area. In each subject's personal social areas are displayed privacy selectors as well as corresponding input spaces for the subject to indicate the value of a particular set of information, and a suggestion may be displayed to the subject as to what researchers are currently willing to pay for the said data. Social pages are later described in further detail.

[0356] During the course of the study, it may be desirable for a practitioner to configure the client system to automatically flag incidental, non-routine behaviors e.g. subject takes her or his medication less than recommended dose and has definitive results. The client system may be configured to flag any such incidental, non-routine behaviors and/or outcomes for comparison with results of any such occurrences that are similar in nature, and also to monitor, for a certain time period, certain parameters which may be configured by the practitioner, in order to identify

potentially beneficial behaviors not targeted/identified in previous clinical studies, or for otherwise recognizing implications of these previously undocumented behaviors. An option may be provided to the practitioner to aggregate samples of all similar occurrences of each incidental, non-routine behavior to be analyzed by the client system for any correlations that can be identified between the results of different samples.

[0357] Under certain circumstances, a practitioner such as a researcher or medical advisor may want to be able to contact subjects to obtain additional information, and in these instances the practitioner may access a page corresponding to a “messaging platform” within the client system wherein they will be able to choose a particular subject to send an electronic message to, complete the message field and submit the message. Subsequently, an indicator may be displayed (e.g. inbox icon within a status bar on the subject’s account homepage), which informs the subject that a new message populates the inbox. The subject may access the message from her or his inbox and choose whether or not to respond.

[0358] Throughout this process, where these interactions involve a researcher or a practitioner with whom the subject, through the client system, has indicated that she or he not wish to share personally-identifiable information, the subject’s personally-identifiable information would not be disclosed to the researcher or other practitioner, who would select the particular subject with whom she or he wishes to communicate by specifying a generic identification key which corresponds to the particular subject. To facilitate monitoring via electronic messaging, practitioners may access a module **100** within the client system that allows them to configure automated messages to be sent to certain subjects based on a variety of parameters, and may also be able to limit the subject’s responses by creating a set of preset responses, one or more of which the subject would select (e.g. by clicking or tapping over the selection provided within the message) in order to respond to the message.

[0359] Prior to and during the course of the study, a practitioner may be provided with a means to monitor and be alerted to specific conditions relating to the monitoring activities of any subject. This means may incorporate an interface **103** identifying certain life areas as well as a set of variable parameters applicable to each life area. Input fields relating to each variable parameter may be toggled by the practitioner to define a certain parameter value by which the client system should perform a certain specified command. Thus, the interface **103** may also

identify a set of commands that the practitioner may select, which execute when certain set of parameter conditions are met by the specified subjects during the monitoring process.

[0360] An example of such a command is one that may create a condition that causes the client system to, for a certain parameter, send a message or alert to either the practitioner or to the subject when a certain value is produced through the subject monitoring process. For instance, a subject who is wearing a sensory device that is a pulse gauge and has established a connection with a practitioner through the respective client system process, such as the one described previously in the instance of a researcher, may send pulse readings at predetermined intervals of time or in real-time to the practitioner, who receives an alert when the readings are of a particular value or range of values, which the practitioner could configure through the client system.

[0361] Upon detection of a value in a particular range, the practitioner could opt to receive an alert, collect user data from the subject's client system, and/or send a pre-generated questionnaire message as described in the messaging platform above, aimed at capturing the subject's feedback at the time of the value of interest to the practitioner is detected, which in turn may increase the likelihood that the subject will remember the circumstances surrounding that particular time and hence be able to provide more accurate and complete responses. By interchanging the occurrences within this paragraph of the term "practitioner", with either, "researcher" or "medical advisor", a plurality of processes within the client system become apparent to one skilled in the art. The interaction between a medical advisor and a subject through the use of the client system is further described in subsequent paragraphs.

[0362] The selections made by the subject in responding to the messages sent by a researcher (or, in an alternate embodiment, a medical advisor, practitioner and/or other individual that has been granted permission by the subject to oversee the same subject) may produce changes to the algorithms incorporated in the mining process 107 of the client system for assessing subject user data for a particular study or studies. For example, a certain number of responses that are collected from enrolled subjects who had eaten a certain type of food when their pulses had spiked, might trigger the mining process 107 to create new logic for generating feedback to warn the subject of the potential implications of eating that certain type of food. In order to prepare this automated action, the researcher may select an option within the client

system to set upper and lower control limits for certain parameters such as heart rate.

[0363] When this option is selected and upon detection of outliers to these control limits, the client system might perform an action to be designated by the researcher, such as attempting to identify certain circumstances around the triggering event and reporting these circumstances to the practitioner. In addition, the researcher might be provided with the option to configure the client system to analyze data over specified populations, such as a population of patients living with heart arrhythmias, in order to identify determinants that might establish certain limits as more safe and effective. These findings could subsequently be provided as suggestions to the researcher if the client system detects that the researcher is monitoring patients with associated conditions (e.g. heart conditions).

[0364] The researcher may also select an option through the client system to receive a message when the mining process 107 abstracts new logic that might be useful to the researcher to potentially approve or reject for implementation with the conduct of the study. Depending upon the characteristics of new logic approved for implementation with the conduct of a study, the same logic may be subjected to a review in order to be approved for implementation with the monitoring process applied to all subjects regardless of whether or not the subject is enrolled in a study. The totality of this logic that is incorporated within the monitoring process that is applied to all subjects is called the baseline logic. The baseline logic exists apart from any ad-hoc approval of new logic to be implemented with the conduct of a particular study. In order for new logic to be incorporated in the baseline logic, it must be approved by a community of experts for its applicability to all general users.

[0365] Because not all new logic will be applicable to the total user population, especially where the new logic is designed only for the reporting needs of external users (i.e. practitioners) and not the subjects themselves, new logic that is abstracted from various studies and subjected to this process of review and approval may first be subjected to an automated selection process. This selection process would subject each set of logic to a series of tests designed to ensure that the incorporation of the new logic would enhance the relevance (feedback value, predictive value, magnitude), reliability (completeness, accuracy, objectivity), timeliness, uniformity, clearness and transparency of information produced by the client system relative to the individual user's needs as well as the needs of the entire user population taken as a

whole.

[0366] These tests would incorporate the user data of, either, a population broad enough to represent all of the characteristics of the general human population to a small enough degree of variance, or as broad a population as possible. The logic would be applied to the user data of this population as if it were actually incorporated within the baseline logic of the client system, only in a test environment that does not impact the interaction between the user and the client system.

[0367] In order to test for feedback and predictive value, the test might generate a population of simulated events across various life activities that, if the logic is effective, should produce a desired outcome or outcomes. Failure to produce the desired outcomes might result in the logic being queued for manual adjustment or the desired changes might be applied automatically depending upon the human-configured settings. For feedback value, the outcomes to be subjected to this process may be those with more immediate implications whereas, for predictive value, the outcomes to be subjected to this process may be those with more long-term implications.

[0368] Whereas a test for feedback and predictive value might compare the congruity of the desired outcomes from simulated events to actual outcomes produced by the logic over a limited time frame, a test for magnitude might apply the test over the duration of simulated lives to measure, first, if the logic being tested required additional exertion from its users than what a previously validated and approved configuration might require in order to comply with. Secondly, if additional exertion is found to be required, the test might analyze the value of deviations from already-validated and approved configurations of logic. Thirdly, the test might determine the net impact of the additional exertion required by comparing the measurement of exertion to the measurement of value. If the exertion required does not outweigh the value to be reaped by such deviations, then the value is deemed not substantial enough and the exertion is deemed too great.

[0369] Other tests may be performed by exposing a neural network that simulates human logic (i.e. a simulated user) to events that are produced by the logic being tested and, by the neural networks reaction to the events, judging whether the events produced by the logic being tested are satisfactorily complete (e.g. is the quantity of information provided to the user sufficient for

the desired actions to be taken as a result), accurate, reliable, timely (e.g. information is provided in enough time for the desired actions to be acted upon), clear and consistent (e.g. information can be understood or decoded), and transparent (e.g. the reason and source of information can be understood to help the user develop inferences on her or his own).

[0370] The researcher may also toggle preferences in the client system for a particular study of how sensitive the mining process **107** should be in detecting potential correlations between subject behaviors and outcomes. A separate copy of the logic produced by the mining process **107** would be created for a particular study or studies for which applicable changes could be made. These changes may be incorporated in the creation of a separate mining profile which may be shared with other researchers through a designated shared area. A means may be provided so that researchers could rate a mining profile. Thus, the logic would not impact all users of the client system, but only pertain to those subjects that are enrolled in the researcher's study.

[0371] Because research studies will differ in nature and scope, a subject may need to perform additional steps in the monitoring process specific to the requirements indicated within the research request listing by the person or party initiating the study. These steps may include installing and actively utilizing certain sensory devices, independently-developed solutions, or other previously unused processes.

[0372] Upon enrolling in a study, suggestions may be displayed to the subject as to which processes the user may need to implement in the monitoring process. The suggestion may be calculated through design and implementation of a code installed on the client system database **104** which identifies how often processes are being utilized by the subject. For the purpose of differentiating the requirements typical of various classes of studies, research may either be designated clinical or non-clinical, and clinical research may herein be designated as a particular kind of treatment study (e.g. double-blind randomized trial) or observational study (e.g. cross-sectional study).

[0373] A treatment study may be more likely to invoke periodic submission of medical documentation to study the efficacy of a drug on a patient. Outside of the research setting, a subject would not normally be accustomed to submitting documents, so the client system would automatically recognize this fact and notify the subject of the need to use this process, and also

offer help on how to use it by displaying a help option which, upon being selected, displays applicable advice and further explanation.

[0374] A document submission process within the client system would facilitate transmission of scanned medical information from hardcopies, as well as any files containing information that cannot otherwise be transmitted as reliably through other processes of the client system. On the other hand, an observational study may require a subject to wear a sensory device which the subject does not normally use. A list of general research study formats may be displayed on the researcher's interface 103 at the time of the creation of the research request listing from which the researcher can select an appropriate designation for the research study to automatically activate, prioritize, deactivate and/or deprioritize certain processes that are generally utilized for certain research studies of a particular designation. Meanwhile, the researcher would still retain the ability to consciously select which processes to incorporate. Upon enrolling in such a study, the subject may receive a suggestion that is displayed, through the client system, to the user with the option to potentially inform the user on how to obtain the sensory device and how to use it.

[0375] In either instance, the researcher who is initiating the study may specify, during the process of describing the study requirements, the nature and scope of data that a participating subject would provide. The process of gathering the specified data to be transferred electronically to the researcher may incorporate any of the monitoring processes described in the present invention.

[0376] However, it may be necessary at times for the researcher to obtain data that the client system of the subject is not configured to collect the data that is required by the researcher, either because the subject is not able to purchase the sensory device required of the study or because the sensory device is not yet available for purchase (i.e. an individual magnetic resonance imaging scanner which can transfer data to a client computer). In addition, the researcher may need to deliver an intervention to the subject. In these instances, the subject may need to have tests performed and/or an intervention delivered by a healthcare facility, from where the researcher would also seek to obtain the subject's test results.

[0377] In order to preserve the privacy of the subject's personal information, the subject may receive the tests or interventions at her or his healthcare facility, which the researcher could

order by, through the graphical interface **103** of the client system, selecting a subject and choosing an option to contact the healthcare facility of the subject. While the researcher only sees the encrypted identification key that corresponds to a particular subject, the identification key is decrypted in the process of transferring the message to the healthcare facility in order to identify the subject; however, the healthcare facility does not see the subject's identification key. In the event that the researcher would like the subject to have tests administered and/or interventions delivered by a particular healthcare facility, the subject follow the same protocols as previously described for confirming that she or he is a patient of the particular healthcare facility.

[**0378**] The subject may select a registered healthcare facility through the client system in order to send an automated message to the healthcare facility at the email address that the same healthcare facility provided during its registration process **404**, where someone at the healthcare facility may the email, log in to the client system and view the subject's name as well as the conditions that the subject is required to meet in order to participate in the study.

[**0379**] The person at the healthcare facility may then either confirm or reject that the subject is a patient of the same healthcare facility and that the subject's agreement to the research study terms would be valid on the basis of fulfilling the requirements **405**. From there, the process for communication between the researcher and the healthcare facility would, too, follow the same protocols as previously described. The confidentiality agreement signed by the healthcare facility upon registration protects the subject's personally-identifiable information, even if the researcher is a member of the same healthcare facility.

[**0380**] Since the process of preserving subject personally-identifiable information precludes the researcher from directly administering tests and/or delivering an intervention, and in order to delegate such responsibilities to other parties and monitor results in real-time, the researcher may, her or himself, create researcher accounts that will have access to only those processes in the researcher's study which are specified by the researcher who initiated the study, who is called the research sponsor when separate research investigators are incorporated into the study.

[**0381**] The accounts created by the research sponsor are hereafter referred to as limited researcher accounts. The research sponsor sets up a limited researcher account by, on the

graphical user interface 103 of the client system, selecting the option to add a limited researcher account and toggling which processes to permit access to by the same account. Per terms of use, the research sponsor would specify if a limited researcher works directly with a subject, and the client system automatically includes this condition in the research study requirements to be reviewed by the subject prior to enrollment in the study. A limited researcher account may later be assigned to an individual, who may identify register the particular account to her or himself by entering a key that was generated and displayed to the research sponsor during the creation of the particular account.

[0382] In this instance, the individual to whom the limited researcher account will be assigned (hereafter referred to as “research investigator”) would, like a healthcare facility account, be presented with a confidentiality agreement prior to (during the registration process), or upon, accessing the account for the first time. In any event, all communications around the subject between the research investigator and research sponsor would utilize the subject’s identification key to preserve personally-identifiable information, as in the instance of the healthcare facility.

[0383] The research investigator would be able to identify the subject by name, the research sponsor would only be provided with an identification key corresponding to the subject, and the client system would decrypt and encrypt the client’s name in communications back and forth. Otherwise, the research investigator is not provided with direct access to the subject’s personally identifiable information (as would be the situation for the research sponsor), and instead either receives all information directly from the subject’s client system or healthcare facility, and in this manner is only able to identify the subject by the same identification key that is provided to the researcher who initiated the study.

[0384] As anonymized research data is collected during the course of a study, it may be possible for the researcher to share or hide, their results in real-time, with or from other users, who may be limited researchers with access to the same study, the subjects that are engaged in the same study, or other external parties such as hospitals, universities or the general public.

[0385] Researchers may be required to indicate, within each research request listing, the possibility that anonymized research results could be shared in real-time with related parties such as limited researchers and other subjects involved in the study, and a researcher may choose to

exercise this option during the course of the study. The users may be able to access these results through an option displayed on the graphical interface **103** of the client system. The ability to share anonymized research results in real-time with other external parties may be disabled after the commencement of the study to enable full disclosure of any such parties to prospective subjects prior to enrollment.

[0386] In order to share the results with external parties, the researcher might be required to fully disclose all external parties with which the research results will be shared during the course of the study. Then, during the course of the study, the researcher might have the ability to download a data file from the client system that contains the anonymized research results that the researcher could distribute to external parties. The anonymized research results may also be published on a “research progress” page that can be accessed through the client system that users of the client system are able to view through the graphical interface **103**. These users may be limited to those users specified by the researcher, all registered users, or both registered and unregistered users (i.e. the public).

[0387] Research results may incorporate data collected from the subject during the research study. This data may include data collected during the study at various point in time and in various states of processing i.e. from the initial, unprocessed user data to the data derived from various statistical analyses involving processed **109** and/or unprocessed data. Statistical analyses may be produced through an electronic platform that is integrated into the client system.

[0388] Through the same or similar process that is followed in producing feedback for the subject from her or his user data through the mining process **107**, all research results are uploaded to a database wherein a process of the client system that may exist as a plug-in or module **100** (which is coded with algorithms to generate information related to the researcher’s objectives, and may be based on a pattern-recognition model such as a neural network or multinomial logistical regression analysis) evaluates the raw data **105** and produces a report for the researcher, which the researcher may potentially draw inferences from. The researcher may upload her or his assessment through an option within the client system interface **103** to update the status of the research study, which can then be transmitted to whomever the researcher has chosen to share the information with.

[0389] Amongst various approaches to practicing the present invention, user data may

also be transmitted **302** from a user to other modules **100**, which may be described as clinical data management systems. The said user data may include data that originated from independently-developed monitoring solutions (e.g. separate modules **100**) that are aggregated into a mining module **100** through the incorporation of a plug-in that abstracts relevant data from the independently-developed monitoring solutions and transmits the said data to the mining module **100**.

[0390] Thus, the data may originate from various independently-developed solutions, transmitted to, aggregated and/or analyzed by a mining module **100**, and transmitted to other independently-developed solutions such as clinical data management systems. This process may be carried out by programming the mining module **100** to transmit user data to a particular independently-developed solution. Alternately, the developer of the mining module **100** may develop a plug-in which, when incorporated into the independently-developed solutions, transfers user data from the mining module **100** to the independently-developed solution. Whether the data is passing from or to the subject or the practitioner through the mining module **100** that connects both users, this process describes a flow of user data from the independently-developed solutions, into the mining module **100**, and from the mining module **100** to the same or other independently-developed solutions.

[0391] Such a plug-in may comprise computer programming code for a functionality that is typically utilized by independently-developed monitoring solutions, such as a program for displaying through a graphical interface **103** the user feedback generated from analyzed data and/or a program for aggregating and analyzing the user data. This computer programming code, when incorporated into the code of the independently-developed solution, would take the place of what the developers of the client system, client computer and/or related apparatus might have otherwise been required to program themselves.

[0392] Within the computer programming code of the plug-in are commands to transfer user data from the mining module **100** to the independently developed solution that has incorporated the plug-in into its code. In the same manner, any of the functionalities utilized by a monitoring solution, such as those described in the present invention, could be made available to independent developers through the provision of computer programming code that could be incorporated into the code of the independently-developed solution, which may ultimately help

to defray development costs for the independent developers. Within the computer programming code of the plug-in are commands to transfer user data from the mining module **100** to the independently-developed solution that has incorporated the plug-in into its code.

[0393] This plug-in may also incorporate algorithms to apply markup language to user data (e.g. via XML) which would enable the data, when it is transmitted to independently-developed solutions, to be incorporated into the appropriate rows and columns in database tables which incorporate titles or tags that correlate to the encoded user data. The rules for applying markup language may depend upon the nature, timing, and extent of the creation of the user data. For example, user data that was created through a conscious entry relating to food consumption might automatically be encoded with an XML tag describing particular activity; in this instance, “food consumption”. Additional tags may be applied to this data depending upon the type (e.g. “meal”; “snack”) as well as the time of day of the particular activity (e.g. eating). Likewise, user data that was created through an EEG sensory readout from a sensory device might automatically be encoded to describe the activity as “EEG readout”, and may be further encoded to include conditions that may be relevant to EEG readouts to describe in further detail the nature, timing and extent of the data.

[0394] In addition to connecting and sharing information with a researcher for the purpose of facilitating a research study, the subject, who may not necessarily be subjected to the research process and may be any general user, may also connect and share information in real-time with their own medical advisor. When the medical advisor has completed the registration process, a medical advisor serial number is assigned to the medical advisor that can be shared with patients.

[0395] An area in the subject’s account settings enables the subject to enter their medical advisor’s serial number to share user data with the practitioner. When a subject inputs and confirms her or his medical advisor’s serial number through the client system interface **103**, a prompt may appear on the practitioner’s client system interface **103** asking the practitioner to confirm that the subject is a patient and that, to their best knowledge, the subject has agreed to share user data from their account with the medical advisor.

[0396] Upon confirmation, the medical advisor will be able to access areas of the subject’s user data that the subject has chosen to share. In addition, the medical advisor may be

able to communicate with the subject, and vice versa, in various manners including the manner described in the preceding paragraphs involving a messaging platform. In the event that the subject has a concern that she or he would like to call to the attention of the medical advisor, the subject may be provided with the ability to send a message to the medical advisor through an option within the client system.

[0397] Such messages may involve concerns for which the subject requires medical documentation, such as a medical note indicating the condition of the subject to the extent required by an external party with whom the subject interacts, such as an employer. However, such medical notes can often indirectly disclose more information than is desired by revealing the name of the medical advisor and the medical practice in which she or he works. If the medical advisor's name is unique and/or she or he works in a medical practice and/or healthcare facility that, by its name, describes the particular condition that affects the subject, the external party to whom the medical note is addressed may be able to, by performing a search of the medical advisor on the World Wide Web and/or by calling the phone number of the medical practice or healthcare facility, identify the condition affecting the subject.

[0398] Under unfortunate circumstances where the employer typecasts individuals affected by a particular condition as being predisposed to certain characteristics that make the affected individuals less employable, the knowledge of the employee's condition could lead to unscrupulous tactics such as pigeonholing the employee into situations whereby the employer may misleadingly terminate the employee without consequence, or be used to disseminate, amongst colleagues and/or peers at other companies, the employee's condition and diminish her or his future prospects. While the law affords some protection to individuals who find themselves under such circumstances, an employer with vast legal resources may carefully craft strategies for depoing the employee while skirting laws, and thereafter, pose such a legitimate threat to an employee with scarce resources by, both, the ability to smear the employee's reputation as well as overpower any kind of legal contest, that the employee would face potentially devastating risks along with minimal likelihood of any kind of a positive outcome that would warrant the investment of the employee's scarce limited resources.

[0399] Thus it may be considered a critical responsibility for both the individual affected by the condition as well as her or his healthcare provider to preserve confidentiality over the

individual's medical status. One way to achieve this objective is to provide a means for discretely validating the individual's medical note i.e. without disclosing identifying information about the healthcare provider, including the name of the medical advisor as well as, possibly, the medical practice and/or healthcare facility. An approach for validating the identity and credentials of a healthcare facility that is described in earlier paragraphs may be incorporated in an automated system whereby an approved healthcare facility may assign, to a particular medical note, a random identification key, which effectively conceals the identity of the healthcare facility, medical practice and medical advisor responsible for producing the medical note.

[0400] By this, the medical note may be annotated with, in the place of any potentially-descriptive insignia such as a letterhead or signature of the medical advisor, this generic identification key, which an external party, such as an employer of the individual who is the focus of the medical note, may enter into a computer program (e.g. a module 100 of the client system that may be installed and run separately from other modules 100, and/or a plug-in of the client system that may be incorporated in the coding of an existing computer program), a webpage, or an automated telephone system that checks the generic identification key against a database that contains the information of healthcare provider that is responsible for producing the medical note. A positive identification would inform the external party that the medical note originated from a valid source, and potentially also provide the external party with additional, non-invasive information about the healthcare facility, the medical practice and/or the medical advisor.

[0401] An embodiment of the invention may also incorporate video recording of a subject, provided the subject's consent, through a camera that is mounted on a hands-free client computer as described in the preceding paragraphs. For illustration, video recording arrangement may be performed in a research study if the researcher clearly indicates the requirement of such in a request and the subject agrees to the arrangement. Video recording may either be continuous or at intervals chosen or agreed-upon by the subject.

[0402] In either of these video recording arrangements, between a subject and a researcher, or a subject and the subject's medical advisor, or between a subject and another subject (see below for detail on social functionalities), while the video recording system is actively recording but not necessarily storing and/or saving the recordings permanently on the

subject's operating system **113 114 115** hard drive or on a remote storage server, recordings may be stored in the range of a certain time interval from the past (i.e. from the present to one minute ago, where recordings that are over one minute old are actively deleted).

[0403] This process addresses the limited data storage capacity on the user's operating system **113 114 115** hard drive or on a remote storage server. In this instance, commands coded into the mining module **100** enable the system to recognize recording data that is beyond the range of the time interval in which recordings are to be stored; expired recording data which is actively removed from the storage device that is incorporated in the system.

[0404] In the event the subject wants to access and replay a recording, the subject may perform pre-defined trigger action, which may be set by the user (i.e. Verbalizing a voice command such as "replay 45" activates the replay process and displays a video from 45 seconds ago). The user would define a voice command by accessing a page from where settings for the video recording process can be defined, and selecting an option to define voice commands. While watching the video replay, the subject can verbalize certain commands to access additional functionalities (e.g. Stop, play, rewind, fast forward, or save a specific portion of the video replay – for example, from 0:30 to 0:60 seconds into the video). A saved video can then be tagged with a certain identifier that can be used to categorize the video and store it in a designated folder or area corresponding to the identifier.

[0405] This designated folder or area corresponding to a particular identifier might only be accessible to the subject who created it, or it may exist as a shared folder or in a file location that may be accessible to a limited number of other users (e.g. the subject's connections), or to the general public. For example, a subject may, using a hands-free client computer configuration, video record preparing a dessert and tag the video recording with an identifier such as "desserts" by performing a certain command such as saying "tag desserts", by which the video is saved and stored into a designated shared area for videos with the said identifier. The connections that this designated area is shared with will be able to view the video of the preparation of a particular dessert, and also upload videos of themselves preparing a dessert.

[0406] As the video recording process may be incorporated in an arrangement (including a plug-in or a module **100**) involving any kind of user(s), and not being limited to the arrangement described above that involves a medical advisor and a subject, a user may choose to

begin a video recording and share the recording with other users in real-time as it is being recorded by toggling a privacy selector that may be accessible to the user when she or he is setting up a particular recording session. During a video recording session a user might view the privacy selector from a designated page and add and remove users to share the recording with. Saved videos may also be transmitted to a medical advisor or other user at any time after the recording has been completed, and may also be shared with a plurality of users and/or posted in a public space through processes within the client system that are collectively referred to as the “social area”.

[0407] In addition to practitioners, connections may be formed by any kind of user with any other kind of user through the “social area”, and the user of the social area, who may be registered as a subject or a practitioner, being enabled by the privacy processes described in the preceding paragraphs, may designate which content to share with other users through the social area. The social area may comprise, amongst its processes: one-on-one private chats that may include video conferencing with other users; discussion forums, which may be used for posting questions, feedback and answers to the community; and activity feeds, that may also incorporate subject user data by which subjects could share relevant monitoring information with their specified connections.

[0408] Thus, the video recording process described earlier may enable a user to upload recorded videos to a designated social area whereby the user may create her or his own entertainment viewing station, similar to a TV station except using recorded videos from individual’s life. The client system might be configured to analyze user data to understand what aspects of the user’s life the user would prefer to incorporate in their station, such that the client system could save recordings and query the user on whether she or he would like to upload and/or share the automatically recorded video. The client system might also be configured to understand other preferences of the user related to the video production including production elements such as lighting and visual filtering, as well as sound effects and background music, and present these suggestions to the user during the recording of the video and/or automatically apply these settings without user approval, provided her or his prior consent.

[0409] The social area may also comprise private group pages that users may create and/or join to facilitate forming new connections and to participate in, with other users (who may have a higher likelihood of sharing similar interests based on the title or description of the group

page), live chats, which may include non-text chats (i.e. communication with other users through the real-time transmission of data captured by an imaging and voice-capturing device such as a webcam 509 509).

[0410] Additional content displayed on group pages may include a feed of relevant discussion forum topics that are marked with tags of interest to the group and news publications that contain keywords of interest to the group. From a designated page a user may also discern when their medical advisor is online through a visible indicator and send private chat messages or engage in a live non-text or text discussion with the medical advisor. The medical advisor may be prevented from discerning when the user is online if a particular privacy option is enabled by the user. A discussion forum may be visible to all users, including medical advisors, where questions and answers could be posted without potentially disrupting a user's online session with unsolicited chat requests.

[0411] The incorporation of non-text chats may exist in the form of chats by which voice signals are recorded by voice-capturing sensory equipment and are transmitted to other chat participants within the group environment (hereafter referred to as a voice chat). Depending on the nature of the chat, certain arrangements may be necessary to make it less likely that users will simultaneously talk during the chat and result in audio output that is indiscernible to the members of the discussion. As such, the voice chat process may be: only accessible by groups with a certain limited number of members present in the chat room, or, the number of users that can access a voice chat discussion is limited, or, a moderating procedure is incorporated in the conduct of a given voice chat. While the first two arrangements incorporate compensatory controls in order to mitigate the said risk, the third may also take the form of an automated application control that can be incorporated in a number of ways.

[0412] One embodiment of an automated voice chat moderating process may allow for a number of users (which may be limited) to join a voice chat room, either through invitation from other users (that may be displayed to the user while logged in to the client system or in an email message), or by selecting the room listed on a designated page within the client system interface 103, or through voice command (e.g. to perform a search for discussion groups with certain tags), or by some other means of communicating with the client system user interface 103. Once a number of users have joined the discussion, they may interact with each other by each utilizing

a certain client computer configuration that incorporates a webcam **509** that captures video and audio signals, which may be transmitted to the client computer memory storage where the client system may recognize the signals and transmit them to other users through the same client system to be displayed on the client system interfaces **103** of other users.

[0413] Where an automated moderating process is present in the group voice chat, each interaction follows a certain set of rules that may be generated by algorithms programmed into the **code 110** used to generate the client system. The rules may govern that only one person or a select number of people are able to speak and have their voices heard by the rest of the group at one time. Hereafter, the user that is speaking or otherwise is able to have their voice heard by other users in a group voice chat at a particular point in time is called the “speaker”, and the user that is listening to the speaker or is otherwise not able to have their voice heard by other users in a group voice chat at a particular point in time is called the “listener”.

[0414] For instance, a speaker starts a conversation by making a statement, and while the speaker is talking, all other users (“listeners”), who may not be able to have their voices heard by other users present in the chat, can view an object button on-screen that they may select, or they may perform a designated act that triggers a command, to indicate that they would like to respond. If one or more listeners indicate that they would like to respond while the speaker is speaking, each listener who indicated that they would like to respond may be given an opportunity to speak to the rest of the group after the speaker is done speaking.

[0415] The automated moderating process, which may exist in the form of a module **100** or plug-in, may incorporate voice recognition by which the client system is able to recognize when the speaker is done speaking without conscious effort from the user. Voice recognition may be achieved by mapping the inflection of, and associating, a voice with the user from whom the voice originated. Such a user may be designated as “speaker” at a particular interval of time and, when the speaker’s voice is inactive, the client system may recognize that the user, to whom a particular mapped voice is associated with, and who may be designated as speaker at that particular interval of time, may have finished speaking.

[0416] Through the ability to discern one user from another based on the characteristics of their unique voices, the client system may be configured to, depending upon the circumstances, automatically execute the next logical step in this process of automated

moderating after a speaker has finished speaking, or, alternately, display a prompt inquiring about whether the user has finished speaking. The speaker may also, with or without first being prompted, consciously select an object upon the client system interface 103 or perform some other pre-defined command in order to indicate that she or he has finished speaking.

[0417] The number of listeners that are allowed to respond to the speaker at a given time may be limited. The option to define this number may be provided to administrators, group leader and/or speakers. The option to define this number may also be enabled for a user with lesser privileges (e.g. a speaker) by a user with greater privileges (e.g. an administrator). Where the option to define this number is not enabled for the speaker, the number may be set by an administrator or group leader. For example, if twelve listeners request an opportunity to respond to the speaker, the speaker may or may not have the ability to choose the number of listeners to allow to respond, and even if she or he does have that ability, the number that the speaker is allowed to choose may be limited by a user with greater privileges (e.g. administrator enables the speaker to choose anywhere from one to six people to respond to her or him).

[0418] In the instance that the speaker that was speaking does have an option to select the number of listeners to allow to respond, a prompt will appear when the speaker is done speaking informing the speaker how many listeners have requested to respond, which may only be up to a pre-configured limit. In the same instance where twelve listeners request to respond, but the pre-configured response request limit is five listeners, the speaker that was speaking may elect to choose up to five listeners to respond, and may also have the option to select the specific listeners to allow to respond. Alternately, the speaker that was speaking may only be permitted to select a number of listeners to respond, but not be able to choose specific listeners.

[0419] In the instance where the response request limit was five, and assuming that the speaker at the time elected to have three listeners respond; in a scenario where the speaker does not have the ability to choose the specific listener to allow to respond, an algorithm coded into the automated moderating process may select the selected number of listeners (in this instance, three, out of the twelve that requested to respond) either at random, or by analyzing the number of times that each listener who requested to respond had previously received positive feedback while they were speaking (i.e. the number of times they were “liked”). This value may comprise an aggregate of the number of times the listener was liked either during his last opportunity to

speak, during the course of the same chat, or during the course of all of the chats that the particular listener has attended in the past. Alternately, the value may comprise an aggregate of positive and negative feedback (i.e. likes and dislikes).

[0420] Positive feedback is given to a speaker while they are speaking by listeners who select an on-screen object or perform a designated act that triggers a command to increase the number of positive feedbacks of the speaker. For example, in the event where three listeners are to be selected by the automated moderating process from twelve listeners who requested to respond to the speaker based on the analysis of the number of positive feedbacks for each listener, three listeners that are chosen may be the listeners of the twelve that have the greatest number of positive feedbacks accumulated either in the same chat or also from prior chat sessions. The order that the listeners are chosen to respond in may also depend upon the analysis of feedbacks, positive or negative, of each user or may be a random determination.

[0421] At any time before or after listeners are selected to respond, if they are not speaking themselves, they may withdraw either their request to speak or their granted opportunity to speak by selecting an on-screen object or performing a designated act that triggers a command to bypass the listener's opportunity to respond, for example, if the point that the listener was going to speak to is addressed by someone that speaks before him, and the listener is no longer interested in responding. This action may be accomplished by re-performing the same act that was used to select the option to respond to effectively deselect the option and bypass the opportunity to respond.

[0422] A speaker's opportunity to speak may also be timed. This amount may be a pre-configured amount, or the automated moderating process may recognize speaking patterns and designate an appropriate time limit based on a statistical analysis. For instance, if there is a larger number of participants present in a voice chat room, the pre-configured number of allowable respondents may increase but the window of opportunity for each respondent to speak may decrease. In addition, the time limit may be incorporated in certain situations, as in a situation where a speaker who spoke for a longer length of time in proportion with other speakers during the course of a chat may have a time limit imposed upon their opportunity to speak, and the decision to impose or not impose a time limit, as well as the duration, may be affected by the number of positive feedbacks the speaker generated the previous time or times that the particular

speaker spoke.

[0423] Another way to limit the time a particular speaker has to speak is by allowing listeners to select an on-screen object or perform a designated act that triggers a command to increase the number of negative feedbacks of the speaker. After a pre-configured number of negative feedbacks is reached, a limit may be imposed on the duration of the speaker's opportunity to speak. Negative feedback may also be taken into account when calculating the duration the speaker will be allotted to speak upon their next opportunity to speak, or the likelihood that the speaker should be selected from a group of listeners requesting to respond by the automated moderating process.

[0424] Any time a speaker is speaking, she or he may choose listeners to join a live, simultaneous exchange; however, the exchange may be limited by a time limit and the time limit may be impacted by the listeners that are chosen to join in a live exchange with the speaker. Live, simultaneous exchanges may also have a pre-configured time limit to prevent a select few participants from dominating the conversation. Participation in an exchange may afterward impact a listener's likelihood of being selected to respond, and that impact may or may not consider the number of positive or negative feedbacks that were accumulated during the exchange. Speaking for too long or too many times during a voice chat, depending on a number of factors including the number of participants present in the chat, may also impact a listener's likelihood of being selected to respond in the future.

[0425] Granted, a user may not have access to a client computer at a certain time but would like to participate in such a moderated voice chat, it may be possible for she or he to do so without a client computer. Since the only elements required to participate in such a chat are a method for voice recording and transmission (which is embodied in a basic telephone), the ability to request to respond to a speaker, and possibly also, though not necessary, the ability to generate feedback, a user may join the discussion by entering the appropriate login information through the touch tone keypad or by verbalizing the characters comprising the login information at the corresponding automated prompts. Upon entering the correct login information, an additional automated message might inform the user of which keys on the keypad correspond to the functionalities of requesting to respond to a speaker, and generating feedback.

[0426] The automated login prompt might also ask, after the initial login information has

been entered **202**, if any other people will be participating in the voice chat from the same telephone line. If so, the user might enter or verbalize the appropriate key or command and a second login prompt would be provided in order for the second person to enter her or his login information. The same process would repeat for each additional person that will be participating in the voice chat from the same telephone line. Whenever additional users are added to the voice chat, an additional prompt might inform each user of her or his corresponding code. For instance, the prompt might dictate that the user code for user “bobbyjames” is “zero one” and the code for user “stacykelly” is “zero two”.

[0427] The subsequent automated message informing the user(s) of the functionalities available during the voice chat might also inform the user(s) of a keys and/or commands for adding or removing a user(s) from the voice chat from the same telephone line. For instance, one command might generate a prompt requesting confirmation of which user will be leaving the chat, and the user responds with the corresponding information, either by verbalizing or keying in the appropriate username or user code. Another command might generate a login prompt providing opportunity for the new user to enter his or her login information.

[0428] Where multiple users are participating from the same telephone line, requesting to respond to a speaker and/or generating feedback might be achieved by, in addition to performing the designated action, keying or verbalizing the appropriate user’s username or user code. Thus, to request to respond to a speaker, user “stacykelly” might enter “#” to indicate that a user would like to respond, and subsequently entering her user code “0 2”.

[0429] A modification to a standard teleconferencing apparatus designed for use by multiple chat participants might incorporate buttons corresponding to the ability to request to respond to a speaker and the ability to generate feedback, so that each chat participant might have her or his own panel for manually entering commands during the conduct of the chat.

[0430] Because the usefulness of many of the processes in the social area is limited, in part, by the number of valuable connections a user has formed with other users, another process that may be incorporated in the social area is an interface **103** which may display at some point a selectable option to open an electronic registration page wherein a user may register for a friend suggestion process. When using a handheld mobile client computer to run the client system, the registration page that may be displayed on the graphical user interface **103** of the client system to

a user who selects the option to register for the friend suggestion process would display fields by which the user may perform an action to communicate, to the client system, information pertaining to the user's friendship preferences.

[0431] The registration process for a hands-free mobile client computer would involve the same elements except, in the instances where the process requires manual input, an option may be provided to select the field and input data via any of the available options for conscious input 101 via a heads-up display as defined in preceding paragraphs. Alternately, the user may select an option to automate the process of selecting the user's friendship preferences by permitting the mining process 107 (described in the preceding paragraphs) to access user data in order to identify predictors of the user's friendship preferences, from which the client system could automatically configure the user's friendship preferences.

[0432] For instance, the user may have configured all other settings throughout the client system to the most private option, and thus the client system would configure friendship preferences to the most private setting. In addition, the user may demonstrate a pattern of only connecting with members of a certain age group or a certain sex through the social area, and thus the client system would configure friendship preferences to reflect those attributes. The user may also agree to share personally identifiable information with the client system to validate the identity of the user, as well as user data for the purpose of aggregating the anonymized data and generating a friendship profile that could be matched to other people who suit the user's friendship preferences.

[0433] The criteria for matching one friendship profile to another may be based on psychological and sociographic studies on the compatibility of certain personality types. For instance, the user could complete a psychological assessment which would help to determine a user's friendship preferences. The process would be disabled for users under the age of eighteen and would display a clear warning and disclaimer to exercise extreme caution in connecting with strangers, and may strongly suggest attempting to engage with the other user through as many digitalized, remote means as possible, which includes live chats and mail messaging, to learn more about the other user.

[0434] The users participating in this process would be provided an option to toggle the parameters which are used to generate these compatibility profiles, such that information

pertaining to a certain parameter would not be disclosed in the compatibility assessment in order to protect the user's privacy (e.g. if the user is concerned that the compatibility results could be used to deduce information about the user that she or he does not wish to share after she or he has been acquainted with a matched user).

[0435] Likewise, a user may be provided an option to exclude matched users (or, "matches") in the compatibility assessment results that have declined to disclose certain information in the compatibility assessment (e.g. if a compatibility results pertaining to a certain parameter is of particular importance to the user). User data transmitted to the mining process **107** may follow the same privacy protocol wherein the data is anonymized and associated to an individual key to decode the data. The users' identities are revealed only at the time of and to the extent that the users accept a mutual invitation to interact as described in the preceding paragraph.

[0436] Friendship preferences may be defined by a set of parameters that includes level of commitment desired in relationship. In the instances where this parameter is defined as preferring a long-term relationship that includes child-bearing, genetic factors could be incorporated into the compatibility determination. Genetic factors may be assessed through the processing of user data through the mining process **107**; user data which may include results shared from DNA testing services which generate a profile of the user's DNA based on a specimen sample. The mining process **107** could then process two sets of user data to generate a risk profile that calculates the probability of traits expressed in the children of the couple.

[0437] These traits include but are not limited to: physical appearance (e.g. stature; eye color) and personality (e.g. interests; intellectual abilities). In instances wherein genetic testing predisposes two individuals to certain medical conditions, the mining process **107** could include in the risk profile generated by the mining process **107** the probability that such conditions could be inherited by the children of the couple (bearing in mind that users may have the ability to exclude such information in the compatibility results and depend upon both users mutually agreeing to display results on a particular parameter). Other parameters which could define friendship preferences may include moral values, pop culture interests, political and religious preferences, preferred work-life balance, etc. The friend suggestion process may also develop inferences and suggestions based on the information gathered from a user's social networking

profile.

[0438] A user may elect to develop and build a social networking profile incorporating various sections corresponding to a user's personal pictures, videos, as well as personal information including interests, hobbies, "likes", and a social area with static "posts" from the same user or other users which may incorporate any of the aforementioned elements in addition to standard text messages. Certain elements of a social networking profile, or "social profile", may be shared through selection from a set of options, either at the individual social element level through inline privacy selectors corresponding to each individual element, or at the global social area level through options that may be applied to all elements or a category of elements within the user's social area. Within each set of options is an option to "automate" certain tasks, such as the sharing of data.

[0439] Here, sharing of data may be delineated as the compiling, connecting and/or sending processes as described in the preceding paragraphs. In terms more specific to this process, compiling would collect certain data from the user's social profile for connecting with various users to be sent in a particular fashion. Thus, a behavior analysis generated by the mining process 107 would be used to predict which data the user would prefer to share with certain users, and how to prioritize or make that data visible to those certain users.

[0440] For instance, a social connection that the particular user has a lot in common with in terms of "likes", interests, and hobbies, and with whom both the particular user and the social connection have demonstrated positive interaction indicative of a desire for future interactions (such as commenting on each other's news stories or even drawing on user data such as an EEG reading or facial recognition showing positive emotion), the client system, when set to "automate" for the aforementioned social area tasks, might compile data from the user's profile that could be correlated to past interactions and bear a high probability of positive emotion or interest from both parties, and share the said data on an area on the social connection's client system interface 103 that would have a higher probability of being noticed.

[0441] The social connection's reaction to the data shared on her or his client system interface 103 could provide the mining process 107 with additional feedback from which to predict the desirability of such data in the future, which could change the way that such data is shared. For instance, if the social connection's response is negative, in the future, the same data

may be presented in a less noticeable area on the social connection's client system interface **103**, or it may not be presented at all, depending upon the degree of the negative feedback (e.g. demonstration of negative emotion or lack of response) collected from the social connection and an analysis of past behaviors. Conversely, positive feedback collected from the social connection could result in the client system assessing the probability that the social connection will respond positively to a wider range of data from the particular user, and thus the client system would compile a wider range of data from the particular user to send to the social connection.

[0442] In addition to a general "automate" setting across all tasks within the social area, the user may select to automate across categories of tasks within the social area, or may select an inline option within each individual element in the social area to "automate" sharing of that particular element. In other words, the client system would analyze, predict and choose how to best share the data related to the particular element. Furthermore, within both the global social area settings and the inline settings would be provided filters to apply to the "automate" setting to help the client system predict the most desirable actions. For instance, the user may elect to share certain data (generalized or specific) with certain users (generalized or specific) in a certain manner (generalized or specific).

[0443] Sharing specific data might involve the user selecting the specific data she or he would like to share. Sharing generalized data might involve the user selecting examples of the types of data she or he would like to share, or selecting from a list of qualities embodying the types of data she or he would like to share data with. The mining process **107** could then search the user's data in the future for certain cues extracted from the examples that the user selected which could be predictors of data that the user would prefer to share. Regardless of these selections, the mining process **107** could also analyze the user's user data to identify predictors of the types of data that the user would prefer to share. These predictors could then be used to identify data to be compiled for sharing.

[0444] Sharing with specific users might involve the user selecting the specific users she or he would like to share with. Sharing with generalized users might involve the user selecting examples of users she or he would like to share data with, or selecting from a list of qualities embodying the types of users she or he would like to share data with. The mining process **107** could then search for other users in the future for certain cues extracted from the examples that

the particular user selected which could be predictors of other users that the particular user would prefer to share with. Regardless of these selections, the mining process 107 could also analyze the particular user's user data to identify predictors of the characteristics of the users that the particular user would prefer to share data with. In the future, these predictors could then be used to identify users for sharing data with.

[0445] Sharing the data in a certain manner might involve the user selecting the specific manner in which she or he would like the data to be presented to social connections. Sharing the data in a generalized manner might involve the user selecting examples of the particular manners in which she or he would like the data to be presented provided certain logic that is conveyed to the user which represents a set of circumstances. The user might also select from a list of ways embodying the types of ways she or he would like to share data. Regardless of these selections, the mining process 107 could also analyze the particular user's user data to identify predictors of the specific ways in which the particular user would prefer to share with depending upon the circumstances. These predictors could then be used to identify the proper way in which to present the data to social connections on behalf of a particular user depending upon the circumstances.

[0446] For example, a user may apply filters to the automate option at the global social area-level, in order to elect sharing generalized data with generalized users in a generalized way. The user may then select, from her or his existing social area data, examples of the types of data that this particular filter will be applied to. The user may also select an option from a list of qualities or user-matter embodying the types of data she or he would like to share (e.g. professional insight; comedy; sports news). The user may then select, from her or his existing social connection list, examples of the types of users she or he would like to share data with.

[0447] The user may also select an option from a list of qualities embodying the types of users she or he would like to share data with (e.g. work colleagues; close personal friends; fellow college alumni). The user may then select, after being presented with a set of hypothetical circumstances either visually or verbally (e.g. data relates to professional insights, but social connection is currently away from her or his device; or data relates to romantic comedy, but social connection is currently in a relationship), the manner in which the user would prefer that the client system present the data to the social connection.

[0448] Users may also choose to share location monitoring information with individuals or to certain groups, or to the general public. Users may then be able to see where all of their connections are located at a given time on a display page containing a map and using markers that represent certain connections. In the event the user chooses to hide their location information except from particular individuals, the user may choose to configure the client system so that their location information will only be shared at certain times, such as when the user performs a predefined command permitting the transmission of location information to the permitted individuals.

[0449] The user may have the option to hide their location information except in the event of an emergency. In order to communicate with the system that she or he is having an emergency, the user may be required to perform a predefined action such as the selecting of a button on a display page or a voice command that is defined through a designated page within the client system interface 103 (e.g. a general settings page), indicating that the user is having an emergency. In this instance, only individuals that may be permitted to access the user's location information (based on the user's selections) would be able to do so under a condition of an emergency.

[0450] The client system may also provide other options for configuring emergency services such as triggering alerts to police, hospitals and/or firefighters depending upon the user's situation and whether the client system is allowed to use user data to detect emergencies and contact the appropriate emergency services. The client system may also be configured to detect areas of concern from the user's user data (for instance, if the user's blood pressure is abnormally high and is at risk of a heart attack) to respond appropriately should an emergency arise, or to offer suggestions to the user to optimally configure emergency settings in the event that emergency settings are configured in a manner that is less than optimal under such escalated circumstances.

[0451] The individuals may also set up a relationship so that their location information is only accessible by the said user under circumstances where the user is having an emergency. Under these circumstances, the said user and all the individuals that have permission to view the user's location, will be able to view the location of the said user as well as the locations of all other users that the said user has permitted to share their respective locations with.

[0452] This process might allow those individuals to access each other's locations as well as the user's location on a screen that may also show traffic information to facilitate logistical planning in the event of a rescue. Those individuals will also be able to communicate with each other by selecting a button corresponding to a particular user that is overlaid on the display page showing the location of each user (i.e. Traffic map mentioned above) as well as with the user, where they will all have the option to chat individually or on a group basis, using the client system's social processes, or alternately they may choose to text or call each other by telephone.

[0453] Another process that may be incorporated within the social area is an interface 103 which may display at some point a selectable option to open an electronic registration page wherein a user may register as a potential live cell donor (i.e. a user who is willing to donate, from their own anatomy, amnion, skin, bone, blood, marrow, blood stem cells, umbilical cord blood and/or any other live cells), or live cell transplant candidate (i.e. a user who wishes to transplant, into their own anatomy, amnion, skin, bone, blood, marrow, blood stem cells, umbilical cord blood and/or any other live cells). The registration page that is displayed on the graphical user interface 103 of the client system to a user who selects the option to register as a live cell donor would display fields by which the user may perform an action to communicate, to the client system, information pertaining to the condition of the user's cell.

[0454] In one embodiment, it may be possible for this particular user to specify for which cell compositions the particular user is willing to donate (and alternately, for which cell compositions that the user is not willing to donate). The registration page that is displayed on the graphical user interface 103 of the client system to a user who selects the option to register as a live cell transplant candidate would display fields by which the user may perform an action to communicate, to the client system, information pertaining to the user's need for particular cell(s) to transplant.

[0455] The information that is communicated by the user to the client system is evaluated by the client system to generate matches between the cell(s) that live cell donors are willing to donate (by virtue of their selections during the aforementioned registration process) and the needs for particular cell(s) to transplant in live cell transplant candidates (by virtue of their selections during the aforementioned registration process). In order to perform this assessment, the mining module 100 would analyze information that identifies the conditions that make live

cell(s) from a donor with certain characteristics suitable for transplantation into a transplant candidate with certain characteristics. This information may be obtained from the users' monitoring histories or other user data. Alternately, the live cell transplant candidate might have the option to search a database of live donor listings that match their particular needs.