

TELE-HEALTH AND TELE-MEDICAL FACILITATION SYSTEM AND METHOD THEREOF

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FIELD OF INVENTION

[0001] The present invention generally relates to health and medicine facilitation systems, and more particularly to a centralised platform for various health and/or
10 medical-related services and solutions.

BACKGROUND OF INVENTION

[0002] In the health industry of the emergent world, a great majority of current health
15 disorders; healthcare issues and diseases are recognized or identified manually; owing to the fact that all healthcare or health records are also stored manually rather than digitally. In certain aspects such manual record-keeping may pose unfavorable consequences, particularly in the ability to swiftly identify threats or diseases of a patient or individual. Therefore, the level of convenience in accessing medical data
20 and records play a significant role in providing reliable information on health related issues, disorders and diseases. Subsequently, based on the gathered data, experts of the industry are able to broaden their studies on the diseases, including for performing diseases characterizations and measurements; while patients can know the current status of their medical conditions prior to deciding the steps to proceed. It
25 can be mentioned here that promptness to being notified of a certain medical condition or healthcare information and thus response to such conditions in many parts of the world is highly significant in order to efficiently and timely acquire relevant treatments or medications.

[0003] A relatively conventional example of collection and thus storing data or as a principle source of information is via manual records or a passive database system; whereby said database merely replicates or stores data and do not provide any form of data exchange; be it locally or between external parties. Such sources may be reliable to an extent, but they suffer from several disadvantages; the data stored may
30 not be the latest. In addition, considering that such databases are generally not linked to medical institutions or any institutions providing health and medicinal services. Further, a great majority of the available databases are configured to store a specific set or type of data and information based on at least one disease ; thus in
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many cases separate databases are required to install different types of medical records and information.

5 [0004] As a result, medical information are scattered and not efficiently managed; and eventually leads to unnecessary duplications of investigations and treatments particularly in the cost of medical care. This is also in addition to the fact that users or patients tend to hop doctors

10 [0005] The above-discussed drawbacks have cropped up due to the lack of; if not the unavailability of a health and medicine ecosystem or a centralised platform that enables user access for information at any time and from any location.

15 [0006] In order to prevail over the shortcomings of the conventional methods available experts of the respective industry are constantly developing solutions to increase and thus improve the efficiency of providing medical information or records to patients and practitioners. Nonetheless, most of the known in the art data storing systems have their own drawbacks, be it in the method of operation or insufficient features. For instance, these systems and methods are not configured as real-time application, and more often has restricted accessibility; whereby it is restricted in the
20 sense that information is not readily available for users.

[0007] Therefore, there is a need in the prior art for real-time and a more centralised data collection method or system to facilitate patients/users with respect to educating them on their current medical conditions and altogether for assisting analysis
25 purposes.

[0008] Apart from the above, the current systems are not configured or connected to other communications mediums therefore the variability in terms of updating the stored data is limited.
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[0009] Recognizing the aforementioned shortcomings, the present invention has been accomplished to improve the medical and/or healthcare data and information systems.
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SUMMARY OF INVENTION

[0010] In one aspect there is provided a health and medical facilitation system; for assisting in providing data and input in relation to health and medical data within a network; said system comprising: a user device configured to access, receive and send input to the system; a management and facilitation platform configured to perform the following tasks: receive input from the user device and accommodate all health and medical input received; whereby said input is provided as retrievable data; process the received input and generate a solution to be sent to the user device; wherein the received input is filtered into supplementary and core data; and storing the filtered data; an analytical cluster being in communication with the management and facilitation platform configured to enable further analytical processing and generate insights and predictive scenarios; at least one service provider module being in communication with the management and facilitation platform for health and medical exchange of data and services; and at least one external health and medical information module being in communication with the management and facilitation platform for providing health and medical exchange of data from external entities.

[0011] In one embodiment, the user device is configured to install and execute at least one application based on the system; and is enabled for downloading and uploading information from the system.

[0012] In another embodiment, the management and facilitation platform includes the use of application programming interface (API).

[0013] In a further embodiment, the medical and health input includes at least one of the following; medical data; medical records; healthcare data and records; diseases and symptoms data; medical and health conditions data; or a combination thereof.

[0014] In yet another embodiment, the system further including a user interface for each module of the service provider and external information system; said interface is configured for managing information and exchange of data.

[0015] In another further embodiment, the managing and facilitating platform includes a cloud computing environment.

[0016] In another aspect of the present invention, there is provided a method for facilitating users and managing health and medical information; the method comprising: connecting to a network; providing a management and facilitation platform for central handling and managing of health and medical information to perform the following tasks; receiving input from a user device; retrieving data from at least one service provider; retrieving data from at least one external health and medical information system; filtering data and input to generate core data and additional data; processing the filtered data to generate an output; sending said output to the user.

[0017] In another embodiment, the method includes authenticating the user device.

[0018] In yet another embodiment, the output generated includes; medical data; medical records; healthcare data and records; diseases and symptoms data; medical and health conditions data; or a combination thereof.

[0019] In a further embodiment, processing the filtered data includes the steps of performing analytical processing to generate insights and predictive scenarios.

[0020] In another embodiment, the step of retrieving data further includes the step of accessing data from anywhere and anytime upon authenticated.

BRIEF DESCRIPTION OF DRAWINGS

[0021] The present invention features, objects and advantages thereof may be best understood by reference to the following detailed description when read with accompanying drawings in which:

[0022] FIG. 1A shows an overall view of the system in accordance with an embodiment of the present invention;

[0023] FIG. 1B – FIG. 1D show the general architecture and structure of the system in accordance with an embodiment of the present invention;

[0024] FIG. 2 shows the overall flow of the data storage process in accordance with an embodiment of the present invention; and

5 [0025] FIG. 3 shows the overall process flow of the method in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

10 [0026] The present invention features, objects and advantages thereof may be best understood by reference to the following detailed description when read with accompanying drawings in which.

15 [0027] For the purpose of clear description and avoidance of doubt, the term “medical data/information” or “healthcare data/information” used in this specification is used to mean or define any form of data and information associated to medical conditions or healthcare or health conditions in overall. Further; the term “data” used throughout this document is to define raw data provided or circulated within the system; which may be provided by a user; an external system or service providers.

20 [0028] In accordance to the embodiments of the present invention there is provided a form of a centralized platform that enables and facilitates users to access features in attempt to collect, detect and store healthcare/medical data in relation to a user/patient; the platform being linked to a plurality of external parties so as to
25 provide a highly enriched database. The system may be managed and operated based on a plurality of modules; each of which is accordingly configured to perform tasks and store retrievable data associated to various aspects of health conditions. The system and method of the present invention is further adapted to provide a self-sustaining through participating external parties i.e. stakeholders, thus creating an
30 integrated centralised “one-stop” medical and healthcare hub.

[0029] Each component, which collaboratively forms the system of the present invention, will be described herewith, in accordance to the embodiments of the present invention.

35 [0030] FIG.1A, FIG.1B, FIG. 1C and FIG. 1D generally show the entire facilitation system 200 architecture in accordance to a general embodiment of the present

invention provides a plurality of internal and external levels or architecture, which generally comprises of a number of communications medium, databases and devices that interconnects with each other within a network. As shown in **FIG.1A**, the system comprises at least one user device **10**, at least one web server **20**, at least one application server **30**, at least one storage database **40** and an analytical cluster **50**.

[0031] The components of the system in accordance with the present invention is interconnected to each other on a network, thus enabling data exchange between components or components with users at any level upon authenticated by the system. In one embodiment, the system may be connected to a network and is constructed based on a cloud computing infrastructure. Accordingly, the users as well as external entities can be connected and access the data within the system at anytime and anywhere with presence of internet coverage.

Components

[0032] The user device **10** is enabled to communicate with the system of the present invention. A user device may include; but not limiting to; computers, mobile devices and wearable devices or sensors. In one embodiment, the user's device **10** is configured to download and upload the health and/or medical data and information. The user device **10** is further configured to send and retrieve data or information from the system.

[0033] The web server **20** in accordance with an embodiment of the present invention is configured to accommodate information received from various parties and entities which are connected or linked to the web server **20**. Accordingly, a user interface to access the web server **20** and retrieve information may be provided; whereby said user interface can be in the form of a module. In one embodiment, there can be a plurality of web servers **20** with dedicated modules to accommodate information and data; and the plurality of web servers **20** are in communication with each other to provide seamless accessibility of data and information. Apart from the modules which will be described hereinbelow, and as described briefly in the preceding paragraph, the web server **20** is enabled for connection with external parties and entities; thus at least one external information module **25**; for example; information systems of medical and research institutions, i.e. and treatment specialists. With such connection or linking, exchanging of data between the system of the present invention and the institutions can be performed. Both service providers

modules and external information modules **22,25** will be further elucidated hereinbelow.

[0034] In one embodiment, and as briefly described in the preceding section, an appropriate interface for allowed users to be connected to the system and thus retrieve information in relation to medical records and health related information. The user interface of the system in accordance to the present invention may include a web interface, which allows registered or subscribed users to extract/retrieve, view and access data from the system.

[0035] The user interface may be configured to be connected accordingly to the management and facilitation platform **100** of the present invention. Accordingly, a display of basic information on the registration or logging in procedure may be shown within the module. Allowed users may need to fill in personal particulars or logging in particulars and requirements imposed by the operators of the present invention.

[0036] The storage database **40** is configured to store all retrievable data thus contain all data in various forms, in relation to; but not limiting to medical records, medical conditions ; healthcare and diseases. The database **40** in accordance with an embodiment of the present invention thereby supports metadata form and facilitate any form of submissions thereto, as accordingly imposed by the operator or system administrators **15** of the present invention. The database **40** is further configured to filter data received from users or external parties; an exemplary of the process is shown in **FIG. 2**.

[0037] **FIG.2** describes the process involved in recording and storing of data received from external parties (medical institutions) and users. The process starts at **201**, during which the medical data and information received from external parties and users are subjected to a sieving or filtering process at **202**, so as to filter basic or essential information at **202A** and additional or supplementary information **202B**; which are then stored in separate databases based on the types of information; at **203**. The stored data can then be retrieved via a user interface at **204**, whereby the user interface may provide user authentication, query and generating of output including reports based on the filtered data. The filtered data and information are then conveyed to the user's device for their reference and further action. During this process, the data and information may be represented to a suitable format to be

displayed on the user's device. The accessibility may be provided with multi-level authentications for users and service providers in order to get access to the data. The system of the present invention thereby provides efficient and secured access of data.

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[0038] In accordance with an embodiment of the present invention, the analytic cluster **50** can include a hadoop type cluster structure; whereby it is configured to accommodate data and perform analytical processing over data collected or received from the platform **100** prior to generating an output. The output can include insights and predictive scenarios based on the information or data received. The analytical cluster **50** is in communication with the platform **100** and thus can be accessed by any components of the platform **100** when the need arises. For instance, upon collected and processed all relevant data, said data may used to analyze the potency of the treatment deployment, the cure rate and may also include cost implications which may be associated to the treatment or medical conditions.

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[0039] The analytical cluster **50** of the present invention may be able to analyze the links and information between environment or demographical influences and outcomes. In addition, users will be able to monitor and possibly analyze the medical health pattern of a patient apart from identifying the new symptoms and conditions based on indicative input from various sources.

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[0040] In another embodiment, the analytical cluster **50** may provide solutions with respect to countering infectious diseases or other health problems might be concealed. In essence, the system of the present invention enables users which include patients and researchers to enhance studies in relation to producing solutions to health tribulations.

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Management and Facilitation Platform

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[0041] As shown in FIG. 1A, the web server **20**, application server **30** and storage database **40** are actively in communication with each other and thus collectively forms the Management and Facilitation Platform **100** of the system in accordance with an embodiment of the present invention. Accordingly the platform **100** includes a cloud environment that provides interoperability and cross-platform connectivity in order to enable participation of external parties through external information modules or service provider modules **25,22** regardless of their IT infrastructures and

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technology base. In particular, the application servers **30** are deployed based on a cloud computing environment. The platform **100** further enables expansion and linkability to public or private institutions; the expansion of features is non-exhaustive limited merely by suitability or services. With reference to **FIG. 1C**, the platform **100** thereby can be divided into three tiers; web tier, application tier and database tier.

[0042] With reference to **FIG. 1A**, the management and facilitation platform **100** can be in communication with a plurality of service providers modules **22**, thereby providing medical and health exchange of data. Each module **22** may be configured based on their respective health and service providers; and thereby configured to manage, provide access; retrieve and receive all data in relation to their specific health providers. All data are then sent to the web server **20** and storage database **30**. In one embodiment, the modules may include an application programming interface (API) for providing a link between the modules and the system of the present invention. It should be noted that the service providers can be formed within the system or provided by external parties/entities.

[0043] With regard to the service provider modules **22**, the services provided may include but not limiting to; epilepsy, rehabilitation, diabetes, hypertension, stroke and various others. Each module is further configured to contain all data relevant to various aspects of conditions ranging from disease information; treatment to researches progress and outcomes.

[0044] Still referring to **FIG. 1A**, the management and facilitation platform **100** in accordance with an embodiment of the present invention is in communication with external entities via external information modules **25** for exchange of data. These modules provide direct communication for the external information parties or systems from various companies or institutions regardless of their IT infrastructures. Accordingly, there can be a plurality of modules to cater and manage various categories of data. External entities include, but not limiting to; hospitals or medical institutes; research and treatment institutes and the likes.

[0045] **FIG. 3A** and **FIG. 3B** provide an exemplary process flow to elucidate the communication process that may transpire between the modules and the platform in exchanging health and/or medical data and information. **FIG. 3A** describes an example of process flow for a user that enters data via the service provider module **22**. At **301A**, a user may enter data related to his/her health or medical condition

through his/her device; to know his/her current medical condition. Next at **302A**, the data entered by the user is fed to the platform **100**; at which the data is further processed, and an output is generated based on the data entered by the user at **303A**. During this stage, the platform **100** may retrieve data from other parties or external systems via the external information system modules **25** to enrich the output to be sent to the user. The output generated is sent to the user at **304A**.

[0046] FIG. **3B** shows an example of the process flow involved with respect to the communication between medical practitioners and the platform **100** in accordance with an embodiment of the present invention. At **301B**, a patient visits a medical practitioner for his/her medical condition. Upon completion of a treatment or consultation, the medical practitioner enters the relevant data and information into the local database for safe-keeping and future reference at **302B**. The local database in this context refers to the database that belongs to and thus maintained by the medical institution. Next at **303B**, the platform **100** retrieves information from the respective medical institution via the external information system module **25** specified for the said medical institution ; whereby said information is stored within the platform **100** for future use and reference in the event that the same patient interacts with the platform **100**.

[0047] A system incorporating the method of the present invention will now be described with reference to the flowchart generalizing an example of an entire operation in accordance with an embodiment of the present invention shown as FIG. **4**. The method starts with **401**, whereby a user provides input or information to the system. It should be noted that the user; can be a user from a research institute, medical institute or a patient. In one example, a patient may provide input to the consultant of a medical/treatment institute after visiting or consulting a medical practitioner; thereby all input are based on the outcome of the consultation. The consultant then proceeds to convey or communicates the input received from the patient to the API platform **100** of the present invention at **402**; thus received by the platform **100** at **403**. The input then goes through data or information; filtering process as described in FIG. **4**, prior to be stored as retrievable data in the database of the management platform **100**, at **404**. At **405**, the user may retrieve data from the platform **100** for further use. In one embodiment, in any event that a user requires data from the system, an authentication process may be performed so as to ensure data stored or transactions of data can be performed securely.

[0048] The system and method of the present invention further enables medical practitioners and healthcare providers to access complete medical history of their patients seamlessly thus reducing the duplications of tests and treatments as the system is connected to a network enabling all parties or users to access data in real-time. Value added services can be extended which can include; among others; intelligent insights and detection of symptoms capabilities.

[0049] From the foregoing, it would be appreciated that the present invention may be modified in light of the above teachings. It is therefore understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

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CLAIMS

1. A health and medical ecosystem and facilitation system (200); for assisting in providing data and input in relation to health and medical data for a user or a patient within a network, said system comprising:

a user device (10) configured to access, receive and send input to the system; a management and facilitation platform (100) configured to perform the following tasks:

receive input from the user device (10) and accommodate all health and medical input received; whereby said input is provided as retrievable data;

process the received input and generate a solution to be sent to the user device (10); wherein the received input is filtered into the supplementary and core data;

storing the filtered and core data;

allowing exchange of data from at least one external system or module;

an analytical cluster (50) being in communication with the management and facilitation platform (100) configured to enable further analytical processing and generate medical and healthcare solutions based on all input received from at least one user device (10);

at least one service provider module (22) being in communication with the management and facilitation platform (100) for health and medical exchange data and services, said exchange is facilitated by the platform (100);

at least one health and medical information module (25) being in communication with the platform (100) and configured to provide exchange of data and services between the system and at least one external system or module; and the service provider module (22);

wherein the analytical cluster (50) receives input from various sources; including external sources that are connected to the system; analyse said input and generate medical and healthcare data and solutions based on the current medical and health condition of a user or a patient;

wherein the analytical cluster (50) is further configured to analyse input based on the environment and geographical influences.

5 2. The system as claimed in Claim 1, wherein the analytical cluster (50) generates medical and healthcare solutions that include treatments for diseases, diagnostics, implications, potency of deployment of treatments, cures, symptoms and medicaments.

10 3. The system (200) as claimed in Claim 1 wherein the management and facilitation platform (100) is based on application programming interface (API).

15 4. The system (200) as claimed in Claim 1 wherein the medical and health input includes at least one of the following; medical data; medical records; healthcare data and records; diseases and symptoms data; medical and health conditions data; or a combination thereof.

20 5. The system (200) as claimed in Claim 1 further including a user interface for each module of the service provider and external information system; said interface is configured for managing information and exchange of data.

6. The system (200) as claimed in Claim 1 wherein the managing and facilitating platform (100) includes a cloud computing environment.

25 7. A method for facilitating users and managing health and medical information; the method comprising:

connecting to a network;

providing a management and facilitation platform for central handling and managing of health and medical information to perform the following tasks;

30 receiving input from a user device;

retrieving data from at least one service provider;

retrieving data from at least one external health and medical information system;

filtering data and input to generate core data and additional data;

35 processing the filtered data to generate at least one type of healthcare and medical solutions based on the health and medical condition of the user;

sending said output to the user.

5 wherein in retrieving data from at least one external health and medical
information system includes exchanging data with at least one external health and
medical service providers to allow them to feed data into the system; hence the system
using the fed data to facilitate in generating health and medical based solutions.

10 8. The method as claimed in Claim 7 wherein the output generated includes; medical data;
medical records; healthcare data and records; diseases and symptoms data; medical and
health conditions data; or a combination thereof.

9. The method as claimed in Claim 7 wherein processing the filtered data includes the steps
of performing analytical processing to generate insights and predictive scenarios.

15 10. The method as claimed in Claim 7, wherein the step of retrieving data further includes
the steps of authenticating a user; and accessing data from anywhere and anytime upon
authenticated.

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