

SYSTEM AND METHOD FOR DELIVERING TELEMEDICINE SERVICES IN REAL-TIME**TECHNICAL FIELD**

The present disclosure relates to a system and a method implemented for providing telemedicine services in a given area. The disclosed system and method allow a medical practitioner to acquire real-time physiological data regarding a patient by operating one or more diagnostic tools remotely. Specifically, the disclosed system and method may guide the patient to maneuver the one or more diagnostic tools around an examination site during a consultation session.

BACKGROUND

Providing timely services and attention to patients resided in remote area located far away from the cities remains a great challenge to our healthcare system. The difficulties can be arisen from different factors such as inabilities of the patient to reach the healthcare facilities in the cities owing to restriction in transportation available, the available specialist in specific field of medicine being located at a distance requiring long hour commute, etc. Therefore, effort has been put into developing system, apparatus and/or program which facilitate the delivery some sort of healthcare services regardless of the restriction posed in connection to distance capitalizing on the ubiquitous internet services. For instance, United States patent publication no. 2007255115 offers a method and an apparatus for providing remote diagnosis and treatment using a cellular telephone having a camera, a display, a speaker, a microphone and a diagnostic software embedded into the cellular phone. Further, United States patent publication no. 20040054760 discloses a telemedicine system for communicating medical information through one or more portable modules configured to collect medical information associate with a patient. Peifer et al. offers another telemedicine system in United States patent no. 5987519 about transmitting medical data including voice and video between a central monitoring station and a patient monitoring station. Also, Soliman discloses in United States patent no. 8279061 about a method for delivering telemedicine services.

Despite the abovementioned telemedicine systems may be able deliver the desired services as setting out, these systems lack the comprehensive interaction between the medical practitioner or doctor with the patient to acquire more reliable and thorough physiological information of the patient to derive a more accurate diagnosis outcome. More importantly, the emotional state of the patient can be a crucial factor to be taken into consideration to conclude a diagnostic result. Emotion of the patient significantly affect the medical or physiological information acquired during any consultation session and the systems offered in the prior arts mentioned above are falling short in this regard. Thus,

there exists the need to have an apparatus, a system or a method in better catering telemedicine services addressing some of the flaws inherited in the earlier systems.

SUMMARY

- 5 The present disclosure aims to provide a system capable of delivering healthcare services in a given region at an affordable price through establishment of multiple telemedicine kiosks installed with essential healthcare facilities for a medical practitioner to derive a diagnostic outcome and offer the needed treatment subsequently. Particularly, the patient attending the consultation session may be required, but not necessary, to maneuver one or more diagnostic tools placed at the kiosks such that
- 10 the medical practitioner can obtain relevant physiological information or data pertaining to the health status of the patient, thus reducing the cost incurred for additional manpower manning the kiosks.

- The present disclosure is also directed to a system and/or method for telemedicine service that the data or information obtained through the plurality of kiosks is used for discovering any potential
- 15 health relating hazard occurring in a known region. Measurement to counter the discovered issues hence can be implemented to reduce the impact caused by such hazard including pandemic or endemic.

- Another object of the present disclosure is to offer a system catering telemedicine service with a
- 20 capability to optimize the capacity of the services provided by having the kiosks to communicate and share the load of patients, particularly directing the patients the next closest available kiosk for consultation when one of the kiosks becomes unavailable.

- Further object of the present disclosure is directed to a system and method providing telemedicine
- 25 services with extension of features which protect both privacy and safety of the patients using the system. Particularly, the kiosk comprises an external enclosure encompassing almost all the components and/or surfaces accessible by the patients that a scheduled disinfection program is run in between each consultation session to prevent spreading of infectious diseases through the use of the kiosk. The external enclosure only permits an authorized patient with or without one or more
- 30 accompanying family members to enter for the consultation session.

At least one of the preceding objects is met, in whole or in part, by the present disclosure, in which one of the embodiments of the present disclosure is a system for delivering telemedicine services to an authorized patient. The system essentially comprises a plurality of kiosks each of which is installed

at a geographical location different from one another in a region, the plurality of kiosks being communicatively connected to one another through a connection to one or more servers, the kiosk comprising (i) a communication module for the telemedicine services and (ii) a diagnostic module having at least one diagnostic tool comprising at least one function to acquire data of health status of the authorized patient; a plurality of practitioner terminals each being capable of communicatively linking to a kiosk for a medical practitioner to provide consultation towards the authorized patient and derive a diagnostic outcome during a consultation session through the server; and a plurality of user terminals each being configured to communicate with the server for a user to reserve and/or schedule an appointment of the consultation session at a predetermined kiosks. Preferably, the at least one function of the diagnostic tool is operable remotely by the medical practitioner through the practitioner terminal.

In more embodiments, the system further comprises an access code generated and sent to user terminal by the server upon reserving and/or scheduling the appointment. The access code is usable to access the predetermined kiosk within a specified duration of the consultation session relating to the reserved appointment.

In more embodiments, the diagnostic tool further requires the authorized patient to maneuver its position and orientation around an examination site on the authorized patient for acquiring the data of health status.

According to a number of embodiments, the predetermined kiosk is identified by the server that the predetermined kiosk is one of the kiosks available and located closest to an address registered under the authorized patient or the user.

According to some embodiments, the user or the authorized patient is directed to reserve an appointment of the consultation session at an available kiosk subsequently closest to the registered address when the predetermined kiosk becomes unavailable.

For some embodiments, the disclosed system further comprises an artificial intelligence module located at the server. The artificial intelligence module is configured to identify occurrence of pandemic or endemic of a diseases based upon the data acquired from a plurality of the authorized patients receiving telemedicine services through the kiosks.

For more embodiments, the artificial intelligence module further assists the medical practitioner in deriving the diagnostic outcome of the authorized patient.

5 In more embodiments of the disclosed system, the kiosk may comprise an external enclosure with a controlled entrance encompassing the communication module forming an encompassed area thereto that accessibility towards the encompassed area and the communication module is regulated by the controlled entrance upon receiving the access code.

10 In accordance with other embodiments, the disclosed system may further comprise a disinfection module assembled to the kiosk that the disinfection module is configured to perform a sterilization course in the absence of human being in the encompassed area.

15 For more embodiments of the disclosed system, the user or authorized patient is provided with a prescription code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session.

20 In more embodiments, the system may further comprise an emotion module to detect and weigh emotional state of the authorized patient in deriving the diagnostic outcome based upon input from the authorized patient and/or observation of the medical practitioner throughout the consultation session.

Another aspect of the present disclosure pertains to a method for delivering telemedicine services to an authorized patient. In general, the method comprises providing a plurality of kiosks each of which is installed at a geographical location different from one another in a region, the plurality of kiosks
25 being communicatively connected to one another through a connection to one or more servers, the kiosk comprising (i) a communication module for the telemedicine services and (ii) a diagnostic module having at least one diagnostic tool comprising at least one function to acquire data of health status of the authorized patient; providing a plurality of practitioner terminals each being capable of communicatively linking to a kiosk for a medical practitioner to provide consultation towards the
30 authorized patient and derive a diagnostic outcome during a consultation session through the server; reserving and/or scheduling an appointment of the consultation session for the authorized patient at a predetermined kiosk through a user terminal communicating with the server by a user; allowing the authorized patient to access the communication module of the predetermined kiosk for connecting one of the practitioner terminals for the consultation session of the telemedicine service according to

the reserved appointment. Preferably, the at least one function of the diagnostic tool is operable remotely by the medical practitioner through the practitioner terminal.

5 In some embodiments, the disclosed method further comprises guiding the authorized patient to maneuver position and orientation of the diagnostic tool around an examination site on the authorized patient for acquiring the data of health status.

Still, in more embodiments, the disclosed method further comprises generating and sending an access code to the user terminal by the server upon reserving and/or scheduling the appointment, the access
10 code being usable to access the predetermined kiosk within a specified duration of the consultation session according to the appointment.

According to other embodiments of the disclosed method, the predetermined kiosk is identified by the server that the predetermined kiosk is one of the kiosks available and located closest to an address
15 registered under the authorized patient or the user.

For a number of embodiments, the disclosed method further comprises directing the user or authorized patient to reserve an appointment of the consultation session at an available kiosk subsequently closest to the registered address when the predetermined kiosk becomes unavailable.
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In more embodiments, the diagnostic outcome of the disclosed method is derived with an assistance from an artificial intelligence module located at the server in addition to the consultation of the medical practitioner. Through the artificial intelligence, the disclosed method further comprises identifying occurrence of pandemic or endemic of a diseases based upon the data acquired from a
25 plurality of the authorized patients receiving telemedicine services through the kiosks using the artificial intelligence.

Accordingly, the disclosed method may further comprise regulating accessibility towards the communication module by way of having an external enclosure with a controlled entrance
30 encompassing the kiosk forming an encompassed area thereto that the controlled entrance permits access to the encompassed area upon receiving the access code corresponding to the reserved appointment.

Preferably, the kiosk further comprises a disinfection module assembled to the kiosk that the disinfection module is configured to perform a sterilization course in the absence of human being in the encompassed area for some embodiments of the disclosed method.

- 5 Also, the disclosed method further comprises generating a prescription code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session.

BRIEF DESCRIPTION OF DRAWINGS

- 10 Fig. 1 is a schematic diagram showing the general establishment of one embodiment of the disclosed system;
- Fig. 2 includes perspective views of the kiosk (a) with and (b) without the external enclosure;
- 15 Fig. 3 is a flowchart showing the steps performed in one embodiment for signing up the telemedicine services;
- Fig. 4 is a flowchart showing the steps performed in one embodiment for signing in a user account through a user terminal;
- 20 Fig. 5 is a flowchart showing the steps performed in one embodiment for a user to reserve or schedule a booking of a consultation session;
- Fig. 6 is a flowchart showing the steps performed in one embodiment for the disclosed system and/or method to manage walk-in patient;
- 25 Fig. 7 is a flowchart showing the steps performed in one embodiment for admitting an authorized patient into an encompassed area of a kiosk to initiate a consultation session;
- 30 Fig. 8 is a flowchart showing the steps performed in one embodiment for a medical practitioner to derive a diagnostic outcome by way of operating one of the diagnostic tools remotely away from a kiosk;

Fig. 9. Illustrates user interfaces respectively present on a (a) practitioner terminal and a (b) kiosk in connection to (i) activation of a diagnostic tool, a blood pressure monitor, and (ii) exhibition of the results acquired;

5 Fig. 10 is a flowchart showing the steps performed in one embodiment to derive a diagnostic outcome with the assistance of the A.I module

Fig. 11 is a flowchart showing the steps performed in one embodiment to conclude a consultation session;

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Fig. 12 is a flowchart showing the steps performed in one embodiment for running a sterilization course after exit of an authorized patient; and

15 Fig. 13 shows various abnormalities detectable through the A.I module via the data obtained from stethoscope regarding to a patient.

DETAILED DESCRIPTION

Hereinafter, the disclosure shall be described according to the preferred embodiments and by referring to the accompanying description and drawings. However, it is to be understood that referring
20 the description to the preferred embodiments of the disclosure and to the drawings is merely to facilitate discussion of the various disclosed embodiments and it is envisioned that those skilled in the art may devise various modifications without departing from the scope of the appended claim.

Patient and user

25 As used herein, the phrase “in embodiments” means in some embodiments but not necessarily in all embodiments.

The term “authorized patient” used hereinafter, in some circumstances, may include one or more family members in addition to a patient appointed to a given consultation session attending the
30 session for better communication and understanding about healthcare of the patient. Under certain circumstances, a nurse or general physician may enter the kiosk along with the authorized patient to perform some tasks during the consultation session.

The terms “user” setting forth hereinafter shall refer to an individual registered with the disclosed system or method with a legit user account, after passing an authentication process, to perform various functions offered in a web-based or mobile-based application in addition to reserving or booking an appointment at a preferred kiosk to receive wide range of telemedicine services received.

5 In some circumstances, the user may not be the authorized patient attending a reserved consultation session but rather a family member helping to make the reservation. In other circumstances, the user is the authorized patient receiving the telemedicine services at the predetermined kiosk.

10 The term “medical practitioner” used hereinafter may refer to at least one of a physician, a specialist of a given medical field, a nurse, a pharmacist, a physiotherapy and a nutritionist who is qualified to provide professional advices with respect to health being of the patient in addition to deriving a diagnosis outcome. More than one medical practitioner may attend a single consultation session as a combined effort to derive the diagnosis outcome, strategize a therapeutic course, or advise on means
15 to improve health being of the subject.

The term “module” or “modules” used hereinafter can refer to any one or combination of software and hardware incorporated and/or interconnected to provide the desired function contributing to the objects of delivering telemedicine services.

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The term “diagnostic outcome” used throughout of the description can be a partial, preliminary or full diagnosis regarding one or more disease states of an authorized patient. Depending on the actual situation of the patient, further tests may be required to verify a diagnostic outcome.

25 Fig. 1 shows a general establishment of one embodiment of a system (100) for delivering telemedicine services to an authorized patient as disclosed in the present disclosure. Essentially, the system (100) comprises a plurality of kiosks (200) each of which is installed at a geographical location different from one another in a region, the plurality of kiosks (200) being communicatively connected or linked to one another through a connection to one or more servers 140; a plurality of practitioner terminals
30 (130) each being capable of communicatively linking to a kiosk (200) for a medical practitioner to provide consultation towards the authorized patient and derive a diagnostic outcome during a consultation session through the server 140; and a plurality of user terminals 110 each being configured to communicate with the server 140 for a user to reserve and/or schedule an appointment of the consultation session at a predetermined kiosk (200). In general, the kiosk (200) comprises a

communication module for the telemedicine services to be carried out in between the kiosk (200) and the practitioner terminal (130), and a diagnostic module having at least one diagnostic tool comprising at least one function to acquire data of health status of the authorized patient. Preferably, the at least one function of the diagnostic tool is operable remotely by the medical practitioner through the practitioner terminal (130). It is important to note that each of the kiosk (200), user terminal 110, the server 140 and the practitioner terminal (130) in the disclosed system (100) are configured to execute different functions for delivering the desired telemedicine services as illustrated in Fig. 1.

According to some embodiments of the disclosed system (100), the practitioner terminal (130) connected to the kiosk (200) can be any computing device such as desktop, laptop, smartphone, tablet computer, mobile pc, etc., which preferably has a practitioner program or application installed thereto enabling, but not limited to, controlling one or more diagnostic tools (221) using a diagnostic tool controlling module, recording and rendering visual-audio communication for the consultation session using a communication module, transmitting data through wired or wireless network, running different modules installed or incorporated thereto, connecting to different user and practitioner terminals (130) for communication, lodging urgent request for immediate medical attention to be provided to an authorized patient using an emergency module, etc.

Similarly, the user terminal (110) can be any computing device such as desktop, laptop, smartphone, tablet computer, mobile pc, etc., which is capable of connecting to and communicating with the telemedicine system (100) for, but not limited to, registering the user or patient to the telemedicine system (100) using a user registration module, reserving a consultation session through online appointment using an appointment and scheduling module, receiving information regarding the appointment, obtaining and/or displaying an entrance code for accessing the kiosk (200), receiving reminder about the appointment prior to the consultation session, receiving a prescription code and/or written prescription and/or medical certificate using report and prescriptions report, making changes to the appointment once allowed by the system (100), making payment using an authorization module, etc. In some embodiments, the user terminal (110) may be placed in a local clinic or pharmacy shop of a given neighbourhood that the patients can register and reserve an appointment thereby in case they have no accessibility to any smart devices or internet services.

Referring to Fig. 2a and 2b, one embodiment of the kiosk (200) used in the disclosed system (100) is illustrated. According to some embodiments, the disclosed system (100) may direct, prompt, or suggest the user or authorized patient to use or reserve a predetermined kiosk (200). Specifically, the

predetermined kiosk (200) is identified by the server 140 that the predetermined kiosk (200) is one of the kiosks (200) available and located closest to an address registered under the authorized patient or the user. Under the circumstances which the closest kiosk (200) or the predetermined kiosk (200) is unavailable for the selected consultation session, the user or the authorized patient is directed to reserve an appointment of the consultation session at an available kiosk (200) subsequently closest to the registered address. The kiosk (200) preferably comprises other modules such as a data processing module for processing the data received from and the data to be relayed the server (140), a control module (210) to regulate operations of other modules, etc. in order to carry out the desired functionalities for the telemedicine services offered. Particularly, the communication module, in some embodiments, comprises a multimedia unit (231) capable of displaying and capturing real-time video data, and a transmission unit for receiving data from the server (140) and relaying the captured data to the server (140). Preferably the communication module (230) is electrically connected to the diagnostic module (220) to receive the captured physiological data, while the real-time video displayed is a feed from the medical practitioner provided through the practitioner terminal (130). For some embodiments, the diagnostic module (220) embedded to the kiosk (200) is configured to, but not necessarily, acquire physiological information or data of the authorized patient through one or more diagnostic tools (221), calibrate the diagnostic tools (221) before or after use of the diagnostic tools (221), detect defects or errors in at least one of the diagnostic tools (221) and subsequently report the detected error to the disclosed telemedicine system (100), and/or remind the patient to place the used diagnostic tools (221) to the designated storage before leaving upon detecting missing of the diagnostic tools (221). The diagnostic tools (221) usable in the kiosk (200) can be any one or combination of stadiometer (221a), weight machine, sphygmomanometer (221c), thermometer (221d), handheld body fat measuring device (221e), etc. It is important to note that at least one of the diagnostic tools (221) has at least one functionality managed by the medical practitioner remotely through the practitioner terminal (130) using the diagnostic tool to derive a diagnosis outcome. Particularly, the practitioner terminal (130) has a user interface different from the kiosk (200) that the user interface at the practitioner terminal (130) is capable of initiating the diagnostic tool through the server (140) or the control module upon switching on one of the tabs (830) corresponding of a given diagnostic tool (221), as shown in Fig. 9.

In accordance with some embodiments of the disclosed system (100), the medical practitioner managing the consultation session is permitted to activate or enable one or more diagnostic tools when the presence of the authorized patient is detected at the kiosk (200). The presence of the authorized patient can be known upon receiving an access code specifically generated and provided

to the authorized patient reserving for that particular consultation session. Without the access code being input through the input means (279) such as a code reader or a keypad the kiosk (200), the medical practitioner may not be allowed to activate the diagnostic tool in some embodiments. Alternatively, the authorized patient is allowed to activate one or more of the diagnostic tools in some
5 embodiments. More specifically, the control module (210) senses the activation of the diagnostic tool (221) and relay the status back to the practitioner terminal (130) via the communication module (230) prompting the initiation of the digital control panel shown in the display of the practitioner terminal (130) thus indirectly informing whether the activated tool is the correct tool to be used and/or status of the activated tool. The parameters about the tool controllable or adjustable by through the
10 practitioner terminal (130) will depend on the tool activated. For example, an otoscope or laryngoscope kept in the kiosk (200) for some embodiments may be equipped with camera and lighting source for real-time imaging an infection site of inside an ear of the authorized patient. The user interface or application interface at the practitioner terminal (130) shall allow the medical practitioner to adjust the brightness of the lighting source, beaming angle of the lighting source,
15 viewing angle of the camera and/or sensitivity of the camera. Also, the medical practitioner may remotely control the initiation of a sphygmomanometer (221c) for measuring the blood pressure of the authorized patient.

To render the telemedicine services offered at a more affordable price, the consultation session at the
20 kiosk (200) may be carried out without any assistance from nurses or medical assistance in some embodiments of the disclosed system (100). Specifically, the diagnostic tool may further require the authorized patient to maneuver its position and orientation around an examination site on the authorized patient for acquiring the data of health status. For example, in some embodiments, a multimedia unit (231) of the communication module prompts the location of the diagnostic tools (221)
25 to be used by showing the location and/or the appearance of the tool. Furthermore, control module (210) or the diagnostic module (220) may be configured to sense removal of the diagnostic tool (221) from its storage (246) and prompt the multimedia unit (231) to further display a clip detailing the manner which the diagnostic tool (221) to be positioned, maneuver and/or used in addition to the real-time verbal instruction given by the medical practitioner managing the consultation session.
30 Preferably, those diagnostic tools to be positioned by the authorized patient are non-invasive towards the body or examination site of the authorized patient. Still, in several embodiments, a nurse or the like medical assistance can be stationed around the kiosk (200) and being permitted to enter the consultation session for applying these diagnostic tools (221) towards the patient for physiological

data collection in case the patient finds the utilization of the diagnostic tool (221) being too complicated to handle.

As described in the setting forth, the communication module (230) equipped to the kiosk (200) serves
5 to create a seamless communication between the authorized patient and the medical practitioner, who manages the consultation session through the practitioner terminal (130). In addition to that, the communication module (230) also establishes communication among various modules required for the operation of the kiosk (200) the modules, establishes communication among multiple kiosks (200) in a given neighbourhood, establishes communication between the kiosk (200) with multiple servers
10 (140), and ensures communication between the kiosk (200) and the practitioner terminal (130) remaining uninterrupted throughout each consultation session for data, communication and information transmission. Essentially, the multimedia unit (231) comprises at least one display unit or one main display unit (232) to present video, real-time or not, to the authorized patient attending the consultation session. The main display unit (232) is commonly required to facilitate the virtual face-
15 to-face meeting between the medical practitioner and the authorized patient during the consultation session. The main display unit (232) is preferably, but not necessarily, touch-enabled to collect immediate responses and/or answers from the authorized patient if such needs are raised in the consultation session by interacting on a user interface provided on the main display unit (232). There are a second or even a third display unit (not shown) in more embodiments of the kiosk (200).
20 Particularly, these auxiliary display units may remain in sleeping or inactivated mode unless one or more instruction video is required to be played for providing guidance to the authorized patient to handle a diagnostic tool (221) or additional information to improve health being of the authorized patient without disrupting the view on the main display unit (232). More preferably, the practitioner terminal (130) may be able to control the manner which these pre-recorded videos being shown to
25 the authorized patient. For example, a specialist can pause the video at certain topic or chapter of the played video such that more verbal information can be given to emphasize the importance of the relevant topic. Apart from that, at least one camera (233) is equipped to the multimedia unit (231) to capture and generate video about the authorized patient and the relay the captured video to the server (140) then further to the practitioner terminal (130) for enabling real-time communication
30 throughout the consultation session. The multimedia unit (231) preferably possesses speaker (234) and microphone (not shown) or the device integrated with both speaker and mic to facilitate verbal communication during the consultation session. The communication module (230) may be configured to record at least one of audio and/or video file with respect to the virtual meeting between the authorized carried out in the consultation session. The recorded video and/or audio files are further

uploaded to a cloud storage or server (140) to be kept for a predetermined period in case any issue of dispute raised regarding to a particular consultation session.

Referring to the setting forth, the communication module (230) is electrically connected, either
5 directly or indirectly, to the diagnostic module (220) to receive the captured physiological data, and the real-time video displayed being a feed from the medical practitioner provided through the practitioner terminal (130). In some embodiments, the data may have to be processed to a format complying with the network and/or internet protocol such as transmission control protocol (TCP),
10 hypertext transfer protocol (HTTP), hypertext transfer protocol secure (HTTPS), file transfer protocol (FTP), user datagram protocol (UDP), etc. before the communication module (230) can actually transfer the data out of the kiosk (200). On the other hand, the data received by the kiosk (200) from the server (140) and/or the practitioner terminal (130) may also require conversion from the format complying with the network protocol to a video and/or audio file format playable on the multimedia
15 unit (231). The acquired data and the received data may be subjected to data compression and data decompression respectively as well before being uploaded to the server (140) and downloaded to the kiosk (200). A processing module (240) is preferably employed, in a number of embodiments, for performing various tasks to convert the acquired and received data. The processing module (240) can be a standalone module in the kiosk (200) or a submodule of the control module (210) according to the configuration of different embodiments of the kiosk (200).

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As can be seen in Fig. 2a, the kiosk (200) constructed for several embodiments of the disclosed system (100) further comprises an external enclosure (270) with a controlled entrance encompassing the communication module forming an encompassed area (275) thereto that accessibility towards the encompassed area (275) and the communication module is regulated by the controlled entrance upon
25 receiving the access code. In more specific, the enclosure (270) is an external wall (271) erected surrounding the various modules of the kiosk (200) and an area with sufficient space for the authorized patient and/or at least one family member to be seated on a provided chair (227) within the enclosed area for the consultation session. More preferably, the external wall (271) is preferably constructed with a combination of sturdy and sound dampening materials such as fiber glass, neoprene rubber,
30 viscoelastic frame, light weight metal alloy, aluminium, etc. to substantially protect privacy of the authorized patient by preventing the conversation about the consultation session from being eavesdropped outside of the enclosure (270). For some embodiments, the external enclosure (270) comprises an entry or entrance which serves to manage and regulate admission into the enclosed area for using the communication module (230) and/or the diagnostic module (220) dedicated only for the

authorized patient. A door (272), which can be foldably or slidably open, along with one or more sensors may be used in some embodiments of the kiosk (200) to manage accession into the area encompassed by the external enclosure (270). A motor controllable by the control module (210) may be mechanically associated to the door (272) for operation of opening and locking of the door (272)

5 to manage accession of the various modules of the kiosk (200). Preferably, an access code is generated and sent to user terminal 110 by the server (140) upon reserving and/or scheduling the appointment. The access code is usable to access the kiosk (200) within a specified duration of the consultation session relating to the reserved appointment. Particularly, in some embodiments, the enclosure (270) comprises a first sensor (274) and an entry openable to permit access into the enclosure (270) upon

10 receiving and verifying an access code and/or biometric information provided by the authorized patient through the first sensor (274). The first sensor (274) can be a code reader to detect and/or extra information from a code given to the authorized patient upon or after making appointment about a consultation session via the telemedicine system (100). Alternatively, the code can be a combination of alphanumeric characters where the first sensor (274) may be omitted while the

15 authorized patients is required to input the alphanumeric code using a keyboard, digital or physical, located around the entry to gain access thereto. Once received the access code, the system (100) verifies whether access code corresponds to the record kept in a database linked to the server (140). The disclosed system (100) validates if the access code matches a consultation session assigned to the time and date, which the authorized patient attempts to access the kiosk (200). The disclosed system

20 (100) shall grant access to the authorized patient upon verifying authenticity of the access code. Otherwise, the control module (210) notifies the patient that the access code is incorrect and denies accession into the encompassed area (275). It is worth noting that any attempt to access the enclosed area early or later than the given time slot of a given consultation session will be rejected by the disclosed system (100). In short, the access code only facilitates accession to the facilities or different

25 modules of the kiosk (200) at a time and date specified by the telemedicine system (100) according to the appointment in record. In addition to the access code, the disclosed system (100) may generate a que code or number to be provided to the authorized patient for reference when queuing for the consultation session outside of the external wall (271). Therefore, in some embodiments, a tertiary display unit (276) or LED sign board may be mounted on the external wall (271) around the entry

30 showing the que number corresponding to the latest consultation session and the time remaining for the current session. The tertiary display unit (276) may also show few que numbers relating to the subsequent consultation sessions and corresponding time estimated for each session to be ready. Particularly, the kiosk (200) comprises a tertiary display unit (276), which is placed around the entrance for the encompassed area (275), for showing the que number of a given authorized user

when his or her name, que number, Identification card number, etc. was called. The called authorized user may input the access code kept in the user terminal (110) or smart device through the input means (279) that the input code along with other patient-related info pre-registered to the telemedicine system (100) will be relayed from the to the server (140) for verification. Once the
5 verification completed, the control module (210) or the server (140) prompts the door (272) of the enclosure (270) to open for the authorized patient to access the kiosk (200). On the other hand, the authorized patient will be refused to enter the encompassed area (275) when the server (140) or the control module (210) fails to validate the information provided from the user terminal (110). In any event that the access code fails to pass the validation step, the kiosk (200) shall inform the access code
10 given being invalid and, optionally, request the user to retry.

Once inside the encompassed area (275), the kiosk (200) may sense presence of the authorized patient using one or more sensor. In some embodiments, the presence of the authorized patient is performed through detecting the weight of the authorized patient loaded on the seat (323). Upon detecting the
15 presence of the authorized patient, the disclosed system (100) notifies the medical practitioner handling the consultation session and prompts the practitioner to call in to begin the consultation or tele-consultation session (324). At the consultation session, the medical practitioner provides guidance to the authorized patient with or without the assistance of other medical staffs of the telemedicine system (100) to use the diagnostic tools (221). The diagnostic tools used are put back into
20 the storage (246), which may perform calibration and sanitization of the diagnostic tools after each use. On the other hand, a post-consultation session may start when the consultation session completed (332), the authorized patient shall receive any one or combination of medical report, medical certificate, prescription or prescription code, etc. sent from the practitioner terminal (130) to the user terminal 110 and/or kiosk (200). For more embodiments of the disclosed system (100), the
25 user or authorized patient is provided with a prescription code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session. More specifically, the disclosed system (100) generates the prescription code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session. The
30 prescription code can be used to purchase the prescribed medicine from a medicine dispenser module of the disclosed system (100), while verification on the identity of the one receiving or purchasing the prescribed medicine at the dispenser module maybe required to avoid drug abuse. Still, the procurement of the prescribed medicine can be done by simply entering the prescription code using

a code reader or the like input means and receiving the prescribed medicine dispensed from the dispenser module free from identity verification in other embodiments.

- Before exiting the encompassed area (275), the authorized patient can opt to print any one of the receive documents through the kiosk (200) and/or download to the user terminal (110) for record and reference. Before leaving the encompassed area (275), the kiosk may offer an option to procure the prescribed medicine (336) from the tele-medicine system (100). For the authorized patient to exit the encompassed area (275) after ending of the consultation session, the control module (210) further comprises an exit switch activatable to open the entrance after ending on the consultation session.
- The authorized patient is required to press on the exit switch to unlock the door (272) in order to leave the encompassed area (275). It is important to note that the exit switch may only become activatable after the medical practitioner confirms on completion of the consultation session or the payment has been made for the services offered.
- Furthermore, the disclosed system (100) is incorporated with a disinfection module (250) comprising various components to create at least a substantially sterile environment in the encompassed area (275) where the consultation session being held. Particularly, disinfection module is assembled to the kiosk (200) that the disinfection module is configured to perform a sterilization course in the absence of human being in the encompassed area (275). The sterilization course may include sterilizing the encompassed area (275) and all other components kept therein using electromagnetic wave radiation and/or disinfectant agent to clear off any potential infectious agent and contaminants adhered on any surfaces contactable by the authorized patients. The electromagnetic radiation and/or disinfectant agent are administrated in each sterilization course at a predetermined period, dosage, and manner to yield the desired outcome of sterilization. Referring to Fig. 2(a) and 2(b), the kiosk (200) comprises an air filter (252) disposed on the top of the external. The air filter is preferably a High Efficiency Particulate Air (HEPA) grade air filtering device which draw air out from the enclosure (270) and pump the drawn air through one or more HEPA filters then into the encompassed area (275) creating a positive air pressure therein. The air passed through the HEPA filter becomes substantially free of airborne particles greater than 0.3 microns. When door (272) of the entry opens, the positive air pressure ensures the filtered air rushes pass the entry substantially blocking admittance of any foreign particles into the encompassed area (275). According to some embodiments, the disinfection module (250) comprises one or more UVC emitting lights (251) positioned within the encompassed area (275) particularly on the side of the external wall facing the encompassed area (275). The UVC emitting lights (251) are positioned within the encompassed area (275) in a manner where the surface area to

be sterilized or disinfected are preferably at optimal. For more embodiments, the disinfection module (250) further comprises a sensor configured to detect presence of a human being within the enclosure (270). The sensor can be a proximity sensor emitting an electromagnetic signal, such as infrared, according to a predetermined pattern and detecting any changes of the reflected signal acquired to
5 identify presence of a human being within the enclosure (270) or the encompassed area (275). Alternatively, the second sensor can be a camera sensor assisted by an algorithm or software executed through the control module (210) to identify a human being from the video or image captured. In more embodiments, the disclosed system (100) may introduce a buffering period in between each consultation session setting aside the time needed for the sterilization course in some embodiments.

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Pursuant to several preferred embodiments, disclosed system (100) further comprises an artificial intelligence (A.I.) module located at the server (140) being configured to identify occurrence of pandemic or endemic of a diseases based upon the data acquired from a plurality of the authorized patients receiving telemedicine services through the kiosks (200) and/or assist the medical
15 practitioner in deriving the diagnostic outcome of the authorized patient. Moreover, in more embodiments of the disclosed system (100), an emotion module is incorporated to detect and weigh emotional state of the authorized patient in deriving the diagnostic outcome based upon input from the authorized patient and/or observation of the medical practitioner throughout the consultation session. The emotion module may be configured to work with the A.I. module to assist the practitioner
20 to derive a more accurate diagnosis by end of the consultation session.

One aspect of the present disclosure involves a method for delivering telemedicine services to an authorized patient with a general establishment illustrated in Fig. 1. The disclosed method is preferably implemented along with the abovementioned system (100), but not necessarily, to deliver
25 telemedicine services at an affordable price to the patients seamlessly. The method preferably comprises providing a plurality of kiosks (200) each of which is installed at a geographical location different from one another in a region, the plurality of kiosks (200) being communicatively connected to one another through a connection to one or more servers (140), the kiosk (200) comprising (i) a communication module for the telemedicine services and (ii) a diagnostic module having at least one
30 diagnostic tool comprising at least one function to acquire data of health status of the authorized patient; providing a plurality of practitioner terminals (130) each being capable of communicatively linking to a kiosk (200) for a medical practitioner to provide consultation towards the authorized patient and derive a diagnostic outcome during a consultation session through the server (140); reserving and/or scheduling an appointment of the consultation session for the authorized patient at

a predetermined kiosk (200) through a user terminal 110 communicating with the server (140) by a user; and allowing the authorized patient to access the communication module of the predetermined kiosk (200) for connecting one of the practitioner terminals (130) for the consultation session of the telemedicine service according to the reserved appointment. More preferably, the at least one
5 function of the diagnostic tool is operable remotely by the medical practitioner through the practitioner terminal (130).

In order to enjoy the telemedicine services offered by the present disclosure, a user may need to register to the telemedicine system (100) to create a legit account for reserving a booking of the
10 consultation session at the preferred time slot, receiving an access code for entering the encompassed area (275) or using the communication module, receiving a diagnosis report or medical certificate, receiving a prescription code to purchase or obtain the prescribed medicines, etc. The process (300) for registering or signing up a user account in several embodiments of the present disclosure can be seen in Fig. 3. Specifically, the user needs to install an application or program to the user terminal 110
15 such that the user terminal 110 can interface with the telemedicine system (100) for performing various tasks thereby prior to accessing the telemedicine services. Alternatively, the user can register the account using a web portal developed to serve the like purposes of the application or program without the need to install the application at the user terminal (110). Regardless, the registration of the account starts with arriving at the main screen of the web portal or the application (301), clicking
20 on a tab specified for sign-up (302) of new user on the main screen followed by being directed to the next screen requesting the user to fill in personal particulars (303). The user is provided with an option to link (304) or directly use a known and verified account or identity (ID) preferably associated with an operation system (OS) platform which the user terminal 110 engaged to access the web portal or application as the user log in identity. For instance, the user can employ his or her existing Google
25 account, an OS ID, as the user account (or ID) of the telemedicine services when the user terminal 110 used is a smart phone or tablet running on Android OS. Likewise, the user existing Apple ID or Microsoft account can be applied as the user identity for the telemedicine system (100) to be registered. The basic personal particulars to be recorded with the telemedicine system (100) is any one or combination of name, number of passport or identity card, nationality, home and/or office
30 address, home and/or mobile phone number, etc. The system (100) may prompt the registering user to further confirm the email address and/or mobile phone number (305) to be employed as the user ID and the mobile phone number for account verification later. Once the registering user confirmed (306) the input user credentials to be recorded for the registering account, the application or web portal directs the user to next page where the user needs to set up the preferred login approach (307).

The user can choose to login using either multifactor authentication or existing biometric information kept at the user terminal (110). After setting up the preferred login approach, the application or web portal will guide the user to the next step to set up the preferred payment method (308), which will be used by the telemedicine system (100) to charge the user for any cost incurred after concluding a consultation session. The preferred payment method may include, but not limited to, credit card, debit card, scan-to-pay method, deposits via prepaid credits, etc. In some embodiments, the user can furnish insurance policies or the like applicable to finance the patient in utilizing the telemedicine system. Finally, the user is further directed to set up medical profile of the user (309). The information for setting up the medical profile may cover medical history, medication history, allergies, family health history, etc. Besides allowing the user to input the information of the medical profile manually, the present disclosure permits the user to link (310) an existing medical profile stored by any healthcare organizations or insurance companies being the participating partners of the telemedicine system (100).

After finalizing the sign-up process, the user can proceed to signing-in the telemedicine system (100) of the present disclosure. The steps involved for the sign-in process (400) for several embodiments of the present disclosure are illustrated in Fig. 4. The sign-in process (400) starts with arriving at the application or web portal main screen (401) succeeding by logging in the using the user credentials or identity along with the selected preferred login approach – multifactor authentication or biometric information (402). Information about the tied OS account is acquired (403) from the user terminal 110 or server (140) if the user has chosen to link the OS ID to the registered user account of the disclosed system (100). Immediately after verifying the sign-in credentials, the telemedicine system (100) shall verify or validate (404) whether the device used to sign-in is a device authorized by the user as the authorized user terminal (110). When the system (100) verifies authorization status of the user terminal, the user can proceed to (406) the dashboard or user profile of the application installed. In case the user terminal logging onto the system is an unknown device, the system (100) shall send a confirmation hyperlink to the registered phone number or email address (405) of the registered account, which the unknown device signed in, and prompt the user to authorize the unknown device to be the authorized user terminal 110 to access the application or web portal under the registered user account before logging the user out to end the sign-in process. The user is permitted to sign-in using the unknown device once it is authorized through the confirmation hyperlink. The user can just click on the sent hyperlink to acknowledge confirmation about the device used. Nonetheless, the telemedicine system (100) may further request the user to upload a scanned copy of the identity card or passport tied to the registered user account as an extra measurement to verify the user credentials.

Further, the process about reserving or booking a consultation session (500) in several embodiments can be seen in Fig. 5. It is important to note that a successful reservation of a consultation session essentially depends on the available opening of the kiosk (200) and available slots of the practitioners.

- 5 By advancing to the interface for scheduling of appointment (501), the application or telemedicine system (100) locates and presents the user a number of available kiosks (200) preferably close to the home or office address recorded with the user account (502). The disclosed method or system (100) may be configured to identify and prompt the user to select a predetermined kiosk (200), which is an operable kiosk (200) closest to the registered address of the user. For a number of embodiments, It is
- 10 possible that the disclosed system (100) and method directs the user or authorized patient to reserve an appointment of the consultation session at an available kiosk (200) subsequently closest to the registered address when the predetermined kiosk (200) becomes unavailable. This happens especially when the authorized patient has a narrow window to attend the consultation session. As soon as the predetermined kiosk (200) has been selected (503), it is possible to reserve the consultation session
- 15 based upon one of the two priorities – practitioner availability and kiosk (200) availability. For example, a user may preferably seek a specialist of a particular medicine field for his health issues rather than just looking for the available opening of the kiosk (200) fitting his schedule. As such, the application of the present disclosure provides an option for the user to firstly search (508) the specialists of a given medicine field. From the list of practitioners retrieved through the search, the user can click on each
- 20 of the named specialists in the list for selecting (509) the specialist preferred then proceeding to checking the available slots of the selected the specialist. Based on the available slots shown, the user can choose the preferred slot (date and time) of the selected specialist (510). In some embodiments, the telemedicine system (100) may only present the time and date of the practitioner selected coinciding with the available opening, time and date, of the predetermined kiosk (200) to improve the efficiency of the reservation process. On the other hand, the user is also provided with the latitude to
- 25 reserve or book a consultation session based on the available opening at the predetermined kiosk (200) by searching through a selection of date and time (504) available of the predetermined kiosk (200) followed by choosing (505) the preferred date and time. Once the preferred date and time have been chosen, the application prompts the user to either (i) select the practitioner chairing the reserved
- 30 consultation session from a list (506) offered by the telemedicine system (100) or (ii) grant the telemedicine system (100) to select the chairing practitioner on behalf of the user (507). Under the circumstances which the system (100) selects the chairing practitioner, the system (100) shall only pick a general physician to reduce the potential cost incurred onto the user unless instructed otherwise. The system (100) may take several factors such as current workload of the available

practitioners, past engagement or experience of the user with a given practitioner, rating of the practitioners, etc. for weighing the best candidate to be picked for chairing the consultation session. The system (100) may demand the user to confirm (511) the patient attending the reserved consultation session. If the user asserts that he or she is going to attend the reserved appointment, 5 the system (100) shall request the user to confirm the appointment details (517). The user can also verify that the reserved appointment is to be used by a dependent (512). User can enter the name and/or identity number of the dependent. The system (100) checks the name and/or identity number entered for any existing dependent account recorded (513) with the system (100). When an existing dependent account was found, the information of the dependent including medical profile docketed 10 earlier will be obtained automatically for finalizing the details of the reserved appointment to be confirmed by the user. Under the circumstance where no existing account can be located for the dependent, the system (100) requests the user to register the dependent (514) by firstly entering the necessary particulars (515) such as name, relationship with the user, date of birth, number of the official identity document, etc. and secondly setting-up the medical profile of the dependent (516). 15 The system (100) further directs the user to confirm the details of the appointment (517) once the medical profile of the dependent has been constructed. Upon confirming the appointment details, the user needs to confirm a preferred payment method to deposit a retainer for the reserved appointment (518). With the retainer secured, a confirmation email or text message will be delivered to the user terminal 110 or registered email address along with an access code and details of the appointment 20 (519).

Referring to Fig. 6, more embodiments of the present disclosure include a process (600) facilitating potential walk-in patient at the kiosk (200) for immediate or almost immediate medical consultation. To start a walk-in appointment (601), the user first scans (602) a location QR code of the kiosk (200) 25 which the user tends to utilize for the coming consultation session. The location QR code is kiosk-specific or tied to the geographical location of the kiosk (200) placed. Through the location QR code scanned, the system (100) checks location of the kiosk (603) and assumes the walk-in patient being near the kiosk (200) bearing the location QR code. In the meantime, the application derives GPS or AGPS data (604) from the location of the user terminal (110) employed to scan the location QR code. 30 By matching the derived GPS data with the known location of the kiosk (200) (from the scanned location QR code), the system (100) can verify or validate (605) that the walk-in patient is indeed at the known kiosk (200). Verifying the actual location of the walk-in patient avoids a different kiosk (200) being wrongfully chosen by the patient thus potentially delaying the medical attention needed owing to reserving the consultation session at the incorrect kiosk (200). In case the kiosk location data and

the GPS data of the user terminal (110) fail to match, the telemedicine system notifies the location detected is incorrect before ending the process to reserve the opening of the kiosk (200). The application installed on the user terminal (110) may be fashioned to detect whether the GPS antenna or the like of the user terminal is on before deriving the GPS or AGPS data for location verification.

- 5 The application may further nudge the user to turn on the GPS antenna or the like if the application discovers that the GPS antenna is off. Having the whereabouts of the walk-in patient verified, the user can proceed to check (607) whether the kiosk (200) is free to be used for his immediate consultation and select the available practitioners from a list provided by the telemedicine system (100). If the kiosk (200) is available for instant use, the user can confirm the booking and the system shall send a
- 10 notification to the practitioner selected (611). Otherwise, the system (100) checks (609) the next available opening of the kiosk (200) then notifies the user about the next available opening. The user can further confirm whether to reserve the next available opening or not (610). with the user whether the user wishes to reserve the new and next available opening of the kiosk (200). After confirming to reserve the next available opening, the system shall send a notification to the practitioner selected
- 15 (611). The system (100) moves to send the user notification and the corresponding access code to use the kiosk (200) during the reserved appointment. The notification and the corresponding access code to utilize the communication module of the kiosk (200) will be delivered (612) to the email address or the user terminal (110) of the user. It is important to note that the disclosed method comprises generating and sending an access code to the user terminal 110 by the server (140) upon reserving
- 20 and/or scheduling the appointment. The access code is preferably usable to access the predetermined kiosk (200) within a specified duration of the consultation session according to the appointment. For some embodiments, the diagnostic tool is free from being activated in the absence of the authorized patient, connection to the practitioner terminal (130) and/or provision of the access code as countermeasures to prevent the diagnostic tool being accidentally switched on rather than used for
- 25 capturing the physiological data.

- Fig. 7 shows the process (700) pertaining to accessing the encompassed area (275) of the kiosk (200) such that the communication module can be used to carry out the consultation session. As mentioned in the foregoing description, the kiosk (200) comprises a reader or sensor for the user to input the
- 30 access code (701) for the system (100) to verify (702) if the user is indeed authorized to gain access to the kiosk (200) at this particular date and time. Assuming that the access code is valid for the consultation session reserved, the telemedicine system (100) activates the unlock protocol (703) granting the authorized user the right to enter the encompassed area (275) and use communication module for consulting with the chairing practitioners by unlocking (704) the door (272) of the external

enclosure (270). In case the access code furnished to the telemedicine fails the verification, the telemedicine shall inform the user (713) about the actual date, time and location which the access code can be used. The telemedicine system (100) may also notify the user when the access code has become expired and no longer usable. The disclosed method and system (100) may further verify
5 entrance (705) of the user by detecting presence of the user within the encompassed area (275) through a proximity sensor installed thereby. The telemedicine system (100) sends an acknowledgement of the human presence to the server (140) for docketing (709) followed by triggering the multimedia unit (231) to display (711) some information about the authorized patient eligible for the present consultation session while the authorized patient waits for the chairing
10 practitioner to call in. In the meantime, the telemedicine system (100) sends a notification to practitioner (710) informing the practitioner that the authorized patient is ready for the consultation session. In case the authorized patient decided not to enter the encompassed area (275) after providing the correct access code, the door (272) of the kiosk (200) remains open (706) for a predetermined interval before closing the door (707) and recording the log about absence of the
15 authorized patient (708) with the server (140). In short, the present disclosure regulates accessibility towards the communication module by way of having an external enclosure (270) with a controlled entrance encompassing the kiosk (200) forming an encompassed area (275) thereto that the controlled entrance permits access to the encompassed area (275) upon receiving the access code corresponding to the reserved appointment.

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Fig. 8 illustrates one embodiment of the process (800) which the practitioner is enabled to remotely operate one or more diagnostic tool for acquiring physiological data about the patient. Preferably, the present disclosure comprises guiding the authorized patient to maneuver position and orientation of the diagnostic tool around an examination site on the authorized patient for acquiring the data of the
25 health status while the chairing practitioner remotely operates on one or more built-in functionalities of the orientated diagnostic tool. In more specific, the process starts with interacting with practitioner terminal (130) by the practitioner. Preferably, the practitioner clicks on a tab (830) or virtual button on the user interface of the practitioner terminal corresponding to the diagnostic tool to be activated. The system attempts to activate the diagnostic tool (802). If the diagnostic tool fails to be activated,
30 the control module at the kiosk (200) shall first check the connection (803) of the kiosk (200) with the practitioner terminal (130) or the server (140). The failure of connection can be technical issues at the kiosk (200) and/or practitioner terminal (130). Nonetheless, the kiosk may attempt to establish the connection (803) with the practitioner terminal for several times prior to informing (804) the server (140) for logging the incident. The system may have the authorized patient to wait at the kiosk for a

predetermined period for the system (100) to resolve the problem before requesting the authorized patient to reschedule the consultation session. As to connection issues relating to the kiosk (200), the control module may relay the issue to the server (140) through other communication channels like GSM text message or a landline call for recording the incident. When the diagnostic tool has been

5 activated, the system (100) plays a video, on the main display unit (232) of multimedia unit (231) illustrating (805) the location of the diagnostic tool in the encompassed area (275) and the procedure which the user shall perform with the activated diagnostic tool in assisting the practitioner to obtain the required information for deriving the diagnostic outcome. Meanwhile, the practitioner may provide additional demonstration and verbal guidance through the multimedia unit (231) about the

10 way to apply the activated diagnostic tool at an examination site for capturing the physiological data relating to the examination site. Once the physiological information has been captured (806), it will be then processed (807) including, but not limited to, conversion, noise reduction and/or filtering, signal enhancement, etc. before relaying or sending the data (808) to the practitioner terminal (130) for validation (810) before being used for the diagnosis purpose. Upon receiving the captured data at

15 the practitioner terminal by the practitioner (809), the practitioner validates whether the data captured is usable for diagnosis (810). The validated data will be saved at the practitioner terminal (130) and sent respectively to the server (140) and the kiosk (200) for filing and viewing. When the data captured fails the validation by the practitioner, the telemedicine system (100) shall notify the failure to the authorized patient using the multimedia unit (231), request the authorized patient to

20 perform again the procedure, and prompts main display unit (232) to replay the video regarding the correct procedure to be carried out until finally the useful physiological information. Multiple virtual tabs (830) or button may be shown on one user interface of the practitioner terminal (130). Each tab (830) bears an icon corresponding to a type of diagnostic tool poised to be switched on or off by the practitioner when it is clicked. There may be sub-tabs to fine tune under each tab for the practitioner

25 to adjust or fine-tune at least one function of the activated diagnostic tool. Optionally, the A.I module can be employed in assisting the practitioner to derive the diagnosis outcome. Also, the practitioner can further enhance the data at the practitioner terminal (130) prior to confirming validity of the data. Fig. 9(a)(i) and Fig. 9(a)(ii) respectively show user interface (U.I) at the practitioner terminal (130) in several embodiments of the present disclosure upon activation and after capturing the needed

30 physiological information from the activated diagnostic tool, stethoscope. Particularly, the U.I at the practitioner terminal (130) comprises clickable tabs (830) each represents one available diagnostic tool at the kiosk (200) applicable for acquiring one or more specific physiological data or information for a designated examination site. In more embodiments, only one diagnostic tool can be activated each time throughout the consultation session. The second diagnostic tool can only be activated after

the first has been deactivated and/or placed into the designated storage. The colour of the tab of the activated tool becomes different from other tabs of inactivated tools as can be seen in Fig. 9(a)(i) and Fig. 9(a)(ii). Fig. 9(b)(i) and Fig. 9(b)(ii) respectively show the user interface at the multimedia unit (231) of the kiosk (200) upon activation of the diagnostic tool and after the physiological data has been acquired. The multimedia unit (231) plays a video (840) to demonstrate the correct procedure, preferably non-invasive, to the user when the corresponding diagnostic tool has been activated by the practitioner remotely. After the acquired data become validated, the system (100) presents the data on the display of the multimedia unit (231) at the kiosk (200) for the authorized patient to view.

Several embodiments of the present disclosure include utilization of an Artificial Intelligence (A.I) module in helping the practitioner to make a diagnostic outcome. Preferably, the diagnostic outcome is derived with an assistance from the A.I. module located at the server (140) in addition to the consultation of the medical practitioner. The process (900) which involves the utilization of the A.I module is illustrated in Fig. 10. The process starts with capturing a physiological data (901) using an activated diagnostic tool or sensor at the kiosk (200), sending the captured data (902) to the practitioner terminal (130) in real time, analysing the data acquired (904) after the practitioner verified validity of the acquired data (903), using the algorithm of the A.I module to compare and analysed the acquired data with existing datasets to identify abnormalities (905), deriving a diagnosis using the compared results (906) and generating a diagnosis outcome preferably with potential aetiology and/or pathological causes (907). The A.I module also allows combination of multiple streams of physiological data to generate the diagnosis outcome by gathering multiple physiological information captured from different diagnostic tools through repeating steps 901 to 906 for each diagnostic tool used. For instance, the A.I module may end up concluding the patient is suffering from hypertension based upon the combined data acquired for EKG and blood pressure of the patient. Moreover, the A.I. module is employed to assist the practitioner to detect heart related diseases through analysing the auscultation data acquired. More specifically, the A.I module is capable of discovering anomaly resided in the auscultation data acquired after training with large training dataset, even some of the acquired data may experience slight data loss or latency owing to multiple external factors in connection to the implementation of the telemedicine system (100). In addition to deriving diagnosis outcome for individual patient, the A.I. module of the present disclosure also assists in identifying occurrence of pandemic or endemic of a diseases based upon the data acquired from a plurality of the authorized patients receiving telemedicine services through the kiosks (200).

The process (1000) for the disclosed system (100) and method to conclude a consultation session can be referred from Fig. 11. It starts with completion or generation of the diagnosis outcome (1001) followed by creation of a summary (1002) of the derived diagnostic outcome. The system (100) then presents the summary (1003) on both practitioner terminal (130) and the kiosk (200). In line with the diagnosis outcome derived, the practitioner can enter or input the treatment and prescription (1004) for the authorized patient. The given prescription will be provided along with a prescription code to the user terminal 110, probably via email sent to the address tied with the registered user account. At the kiosk, the multimedia unit (231) presents the prescription, the corresponding prescription code, the medical certificate, medical record for the authorized patient to review. It is important to note that the disclosed system (100) and method may generate the prescription code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session. The prescription code can be used to purchase the prescribed medicine from a medicine dispenser module of the disclosed system (100), while verification on the identity of the one receiving or purchasing the prescribed medicine at the dispenser module maybe required to avoid drug abuse. For instance, an identity card reader or passport reader can be incorporated to the dispenser module. Likewise, a pharmacy is able to verify the identity of the purchaser buying the prescribed medicine, especially those non-OTC drugs, through a web portal of the disclosed system (100) by scanning or inputting the prescription code. Still, the procurement of the prescribed medicine can be done by simply entering the prescription code using a code reader or the like input means and receiving the prescribed medicine dispensed from the dispenser module free from identity verification in other embodiments. After the authorized patient reviewed the documents received and have no further questions, the practitioner may terminate the call or communication (1008). Optionally, the system may ask if the authorized patient wishes to have the hardcopy of the received documents printed (1005). The printer (228) proceeds to print the received documents as soon as the authorized patient instructs the system to do so. The authorized patient or user can subsequently proceed to make payment (1008) using a one or more payment method such as prepaid credit, credit card, debit card, digital banking services, vouchers, insurance policy, etc. secured with (1009) the disclosed system (100). Alternatively, the user or authorized patient can opt to remit the payment using other digital cashless platform (1010) supported by the disclosed system (100). Further validation is needed (1011) for any payment method which is not saved and secured with the disclosed system (100). Once the payment has been settled (1012), the system (100) shall allow and instruct the authorized patient to exit (1013) the encompassed area (275).

As mentioned in the foregoing description, the present disclosure runs a sterilization course within the encompassed area (275) in between the consultation sessions. Particularly, the kiosk (200) further comprises a disinfection module assembled to the kiosk (200) that the disinfection module is configured to perform a sterilization course in the absence of human being in the encompassed area (275). As illustrated in Fig. 12, the process (1100) starts with reminding the authorized patient to leave (1101) the kiosk (200) that presence of the authorized patient can be confirmed later using the proximity sensor or an infrared sensor (1102). In case the authorized patient ignores the earlier instruction regarding existing the encompassed area (275), multiple reminders will be given at increased frequency and/or higher volume until the system (100) ensures the encompassed area (275) is left empty. The system (100) advances to initiate the disinfection protocol (1104) or sterilization course immediately after evacuating the authorized patient. The sterilization course may activate the disinfection module (1105) comprising UVC radiation, negative air pressure to drain the air out of the encompassed area (275), etc. A notification about completion of the sterilization course will be sent (1106) to the server (140) for record as soon as the sterilization course finishes.

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It is to be understood that the present disclosure may be embodied in other specific forms and is not limited to the sole embodiment described above. However, modification and equivalents of the disclosed concepts such as those which readily occur to one skilled in the art are intended to be included within the scope of the claims which are appended thereto

20

CLAIMS

1. A system for delivering telemedicine services to an authorized patient comprising:
a plurality of kiosks each of which is installed at a geographical location different from one another in
5 a region, the plurality of kiosks being communicatively connected to one another through a
connection to one or more servers, the kiosk comprising (i) a communication module for the
telemedicine services and (ii) a diagnostic module having at least one diagnostic tool comprising at
least one function to acquire data of health status of the authorized patient; and
a plurality of user terminals each being configured to communicate with the server for a user to
10 reserve and/or schedule an appointment of the consultation session at a predetermined kiosk,
wherein the at least one function of the diagnostic tool is operable remotely by the medical
practitioner through the practitioner terminal.
2. The system of claim 1 further comprising a plurality of practitioner terminals each being
15 capable of communicatively linking to a kiosk for a medical practitioner to provide consultation
towards the authorized patient and derive a diagnostic outcome during a consultation session through
the server and the at least one function of the diagnostic tool being operable remotely by the medical
practitioner through the practitioner terminal.
- 20 3. The system of claim 1 further comprising an access code generated and sent to user terminal
by the server upon reserving and/or scheduling the appointment, the access code being usable to
access the predetermined kiosk within a specified duration of the consultation session relating to the
reserved appointment.
- 25 4. The system of claim 1, wherein the diagnostic tool further requires the authorized patient to
maneuver its position and orientation around an examination site on the authorized patient for
acquiring the data of health status.
5. The system of claim 1, wherein the predetermined kiosk is identified by the server that the
30 predetermined kiosk is one of the kiosks available and located closest to an address registered under
the authorized patient or the user.

6. The system of claim 5, wherein the user or the authorized patient is directed to reserve an appointment of the consultation session at an available kiosk subsequently closest to the registered address when the predetermined kiosk becomes unavailable.
- 5 7. The system of claim 1 further comprising an artificial intelligence module located at the server being configured to identify occurrence of pandemic or endemic of a diseases based upon the data acquired from a plurality of the authorized patients receiving telemedicine services through the kiosks and/or assist the medical practitioner in deriving the diagnostic outcome of the authorized patient.
- 10 8. The system of claim 3, wherein the kiosk further comprising an external enclosure with a controlled entrance encompassing the communication module forming an encompassed area thereto that accessibility towards the encompassed area and the communication module is regulated by the controlled entrance upon receiving the access code.
- 15 9. The system of claim 8 further comprising a disinfection module assembled to the kiosk that the disinfection module is configured to perform a sterilization course in the absence of human being in the encompassed area.
10. The system of claim 1, wherein the user or authorized patient is provided with a prescription
20 code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session.
11. The system of claim 1 further comprising an emotion module to detect and weigh emotional
25 state of the authorized patient in deriving the diagnostic outcome based upon input from the authorized patient and/or observation of the medical practitioner throughout the consultation session.
12. A method for delivering telemedicine services to an authorized patient comprising;
providing a plurality of kiosks each of which is installed at a geographical location different from one
another in a region, the plurality of kiosks being communicatively connected to one another through
30 a connection to one or more servers, the kiosk comprising (i) a communication module for the telemedicine services and (ii) a diagnostic module having at least one diagnostic tool comprising at least one function to acquire data of health status of the authorized patient;

providing a plurality of practitioner terminals each being capable of communicatively linking to a kiosk for a medical practitioner to provide consultation towards the authorized patient and derive a diagnostic outcome during a consultation session through the server;

5 reserving and/or scheduling an appointment of the consultation session for the authorized patient at a predetermined kiosk through a user terminal communicating with the server by a user; and

10 allowing the authorized patient to access the communication module of the predetermined kiosk for connecting one of the practitioner terminals for the consultation session of the telemedicine service according to the reserved appointment, wherein the at least one function of the diagnostic tool is operable remotely by the medical practitioner through the practitioner terminal.

13. The method of claim 12 further comprising guiding the authorized patient to maneuver position and orientation of the diagnostic tool around an examination site on the authorized patient for acquiring the data of health status.

14. The method of claim 12 further comprising generating and sending an access code to the user terminal by the server upon reserving and/or scheduling the appointment, the access code being usable to access the predetermined kiosk within a specified duration of the consultation session according to the appointment.

15. The method of claim 12, wherein the predetermined kiosk is identified by the server that the predetermined kiosk is one of the kiosks available and located closest to an address registered under the authorized patient or the user.

25 16. The method of claim 15 further comprising directing the user or authorized patient to reserve an appointment of the consultation session at an available kiosk subsequently closest to the registered address when the predetermined kiosk becomes unavailable.

30 17. The method of claim 12, wherein the diagnostic outcome is derived with an assistance from an artificial intelligence module located at the server in addition to the consultation of the medical practitioner.

18. The method of claim 17 further comprising identifying occurrence of pandemic or endemic of a diseases based upon the data acquired from a plurality of the authorized patients receiving telemedicine services through the kiosks using the artificial intelligence.

5 19. The method of claim 12 further comprising regulating accessibility towards the communication module by way of having an external enclosure with a controlled entrance encompassing the kiosk forming an encompassed area thereto that the controlled entrance permits access to the encompassed area upon receiving the access code corresponding to the reserved appointment.

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20. The method of claim 19, wherein the kiosk further comprises a disinfection module assembled to the kiosk that the disinfection module is configured to perform a sterilization course in the absence of human being in the encompassed area.

15 21. The method of claim 12 further comprising generating a prescription code comprising combined information relating the authorized patient and one or more medicine prescribed by the medical practitioner upon completion of the consultation session.