SYSTEM FOR MEASURING BIOLOGICAL AGE AND SERVICE METHOD THEREOF

【Technical Field】

The present invention relates to a biological age measuring device and method. In particular, the present invention relates to a biological age measuring device and method for increasing relevance of test items by using a large volume of clinical data, and measuring more accurate biological age.

【Background Art】

Human beings have been concerned about the aging process from the ancient times, and they have made every effort to find a recipe for maintaining youth or preventing the aging process by knowing the aging mechanism. A lot of hypotheses for explaining the aging mechanism have been proposed up to now, but the aging process includes the changes over the whole body, and hence, it was incomplete to solve all the phenomena by using one hypothesis.

Therefore, methods for delaying the aging speed through exercise or diet and essentially preventing the aging have been proposed recently. In particular, scientists attempt to overcome the aging by considering it as a disease in the 21st century.

As described, as the modern anti-aging medicine has been started, the scientists have tried to find reliable tools to which scientific concepts and protocols for the anti-aging medicine are applicable, and they have

attempted to develop the system for estimating the aging by using various biological markers. In particular, it is needed to diagnose the aging in the scientific manner since it is possible to find a target to be cured and cure the target when any disease can be diagnosed in the viewpoint that the aging is regarded as a disease, and to decide cured effects after a predetermined time frame.

Recently, the method for measuring the biological age and using the same as a basis for anti-aging for the purpose of scientifically diagnosing the aging is disclosed in the transaction of 'Biological Aging Measurement' in 1988 by Dr. Widin, which became a watershed for anti-aging treatment.

As described, it is required to accurately measure each person's biological age so as to accurately measure his aging state and delay aging through anti-aging remedy, including changes of lifestyle such as exercise and diet, and medical cure such as hormonal cure and antioxidant prescription. However, most of the conventional biological age measurement methods only checks physical and functional abilities by providing questionnaires or simple tests to ordinary persons.

Also, foreign manufacturers have developed biological age measuring systems which however fail to provide sufficient explanatory power (R^2) since they have been developed based on incomplete data that are collected for measuring the biological age.

Therefore, biological age measuring devices providing high relativity

among respective test items and excellent explanatory power (R^2) are required.

The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

【Disclosure】

【Technical Problem】

It is an advantage of the present invention to provide a biological age measuring device and method having high accuracy, high relativity for test items, and excellent coefficient of correlation R and explanatory power R^2.

【Technical Solution】

An exemplary embodiment of the present invention provides a device for measuring a biological age and providing the same to a user connected through a network, which includes: a database for storing information including user data for measuring a biological age; a database manager for performing a database management operation including an operation for storing data in the database, an operation for searching data, and an operation for extracting desired data; a biological age estimator for measuring the user's biological age by using user data stored in the database, the user having requested biological age measurement; a settlement manager for settling the fee used for the biological age

measurement service; and a main server for collecting the user data used for biological age measurement, controlling the database manager to store the user data in the database, controlling the biological age estimator to use the user data stored in the database to measure the user's biological age, and controlling the settlement manager to settle the fee of the biological age measurement service.

The device for measuring a biological age further includes a clinical data database, connected to the biological age estimator, for storing a plurality of test results applied to a plurality of persons for a plurality of years as clinical data.

The biological age estimator estimates the biological age by using a biological age calculation formula that is generated by statistically analyzing the clinical data stored in the clinical data database.

The database includes a member database for storing basic information on a registered member who enters a predetermined membership process so as to use the biological age measurement service; a basic information database for storing user's basic information used for biological age measurement; and a result database for storing information including a measured biological age result.

The basic information includes basic data including reception information on the user to be input by the user, a risk factor, and an extra test result; and additional data including biochemical data and hormonal data

tested by a predetermined test authority.

The biological age includes a body age for indicating the user's body age; a biochemical age for indicating the user's biochemical factor age; and a hormonal age for indicating the user's hormone factor age, and the biological age is generated by using the body age, biochemical age, and hormonal age.

The biological age result includes: comparison contents of the user's chronological age and the measured biological age; the user's body age, biochemical age, and hormonal age; and a counseling guide including analysis and estimation for the measured biological age, body age, biochemical age, and hormonal age results.

The counseling guide includes an anti-aging treatment for the measured biological age.

The user's biological age is periodically measured and the measured biological age result is accumulatively stored in the database to measure the user's aging rate.

Another embodiment of the present invention provides a biological age measurement servicing method for measuring a biological age and providing the biological age to a user connected through a network, which includes: a) collecting basic information on the user when the user requests biological age measurement; b) measuring the user's biological age by using the collected basic information; and c) displaying the biological age

measurement result to the user.

The step a) includes: i) determining whether to request an external test authority to collect additional data on the user; ii) directly receiving basic data on the user from the user; iii) directly receiving additional data on the user from the user when no request is provided to the external test authority; iv) providing additional data on the user to the external test authority when a request is provided to the external test authority.

Before the step of i), the method further includes settling the fee for the biological age measurement service.

【Description of Drawings】

FIG. 1 shows a schematic diagram of a usage outline for a biological age measuring device according to an embodiment of the present invention.

FIG. 2 and FIG. 3 show flowcharts of a biological age measuring service method according to an embodiment of the present invention.

FIG. 4 shows an exemplified reception and settlement screen displayed to a user in a biological age measuring service method according to an embodiment of the present invention.

FIG. 5 shows an exemplified test request checking screen displayed to the user in a biological age measuring service method according to an embodiment of the present invention.

FIG. 6 shows a basic data inputting screen displayed to the user in a biological age measuring service method according to an embodiment of the

present invention.

FIG. 7 shows an additional data inputting screen displayed to the user in a biological age measuring service method according to an embodiment of the present invention.

FIG. 8, FIG. 9 and FIG. 10 show basic data and additional data input by the user in a biological age measuring service method according to an embodiment of the present invention.

FIG. 11 shows a data collection result display and a data analysis request screen in a biological age measuring service method according to an embodiment of the present invention.

FIG. 12 shows an exemplified analysis result displayed to the user in a biological age measuring service method according to an embodiment of the present invention.

【BEST MODE】

An exemplary embodiment of the present invention will hereinafter be described in detail with reference to the accompanying drawings.

In the following detailed description, only certain exemplary embodiments of the present invention have been shown and described, simply by way of illustration. As those skilled in the art would realize, the described embodiments may be modified in various different ways, all without departing from the spirit or scope of the present invention. Accordingly, the drawings and description are to be regarded as illustrative in

nature and not restrictive. Like reference numerals designate like elements throughout the specification.

Hereinafter, referring to the drawings, a biological age measuring device and method according to an embodiment of the present invention will be described in detail.

FIG. 1 shows a schematic diagram of a usage outline for a biological age measuring device according to an embodiment of the present invention.

As shown in FIG. 1, the biological age measuring device is connected to a plurality of hospital servers 20-1 to 20-n and personal terminals 40-1 to 40-p through the Internet 30. In this instance, the respective hospital servers 20-1 to 20-n are connected to terminals 22-1 to 21-m and 22-1' to 22-m' in the hospital, the hospital servers 20-1 to 20-n and the personal terminals 40-1 to 40-p are connected to the biological age measuring device through the Internet 30 or other similar public communication networks, and the hospital servers 20-1 to 20-n and the terminals 22-1 to 22-m and 22-1' to 22-m' are connected thereto, which is well known to a skilled person and will not be described.

A user can access the biological age measuring device 10 through the terminal 22-1 to 22-m and 22-1' to 22-m' connected to the hospital server 20-1 to 20-m or the personal terminal 40-1 to 40-p.

The biological age measuring device 10 collects basic medical examination information such as the user's basic data or questionnaire from

the terminals 22-1 to 22-m and 22-1' to 22-m' connected to the hospital servers 20-1 to 20-m or personal terminals 40-1 to 40-p, and uses the basic medical examination information to measure the biological age.

The biological age measuring device 10 requests to test additional data such as biochemical data or endocrine data used for biological age measurement through the hospital servers 20-1 to 20-m.

The biological age measuring device 10 uses the user's basic medical examination information, default data, and additional data to measure the biological age, and displays measurement results and a corresponding counseling guide to the user.

Referring to FIG. 1, the biological age measuring device 10 includes a main server 110, a member database 120, a basic medical examination information database 130, a basic information database 140, a result database 150, a database manger 160, a clinical data database, a biological age estimator 180, and a settlement manager 190.

The main server 110 is connected to the hospital servers 20-1 to 20-m and the personal terminals 40-1 to 40-p through the Internet 30, and controls all the processes on measuring the biological age. For example, the main server 110 performs a web server function with a member management function, a data collection function for measuring the biological age, and a function for displaying measured result data and counseling guide.

In particular, the main server 110 has a web page database (not

illustrated) for storing home pages and web pages for providing biological age measuring service information according to an embodiment of the present invention so that the main server 110 provides a web service for providing the biological age measuring service to the members who desire to measure their biological ages.

The member database 120 stores information on hospitals or individuals registered through a predetermined membership process.

The basic medical examination information database 130 stores medical examination data directly input by the members having requested the biological age measuring service (e.g., survey data.)

The basic information database 140 stores the basic data directly input by the members having requested the biological age measuring service and the additional data on the members measured by the biological age measuring device 10 or other external test authority.

The basic data include reception data including member names, residence codes and request dates, and settlement confirmation items, and risk factors usable to the biological age measurement including drinking types, smoking types, exercise types, seat belt wearing states, average sleeping times, past and present diseases, and extra test results. In addition, the basic data may further include various factors applicable to the biological age measurement.

The additional data include biochemical data and hormonal data.

The biochemical data include blood types, the number of WBC, the number of RBC, Hemoglobin, Hematocrit, MCV, MCH, MCHC, Platelet, PDW, the number of differentiation, and ESR, and the hormonal data include DM markers having fasting blood sugar, insulin, and HgbA1c, Thyroid markers having F-T3, F-T4, and TSH, endocrine markers having DHEA-S, cortisol, melatonin, and GH markers having growth hormone stimulus tests, IGF-1, and IGFBP-3.

The result database 150 stores measured biological age data and corresponding counseling guide data. It is possible to store measured result data for the members in the member database 120 as additional data the respective members, and it is desirable to provide an additional result database 150 and subsequently and continuously measure and manage the biological ages of the members.

The biological age includes a physical age for indicating the user's body related age, a biochemical age for indicating the user's chemical factor related age, and a hormonal age for indicating the user's hormonal factor related age user. In this instance, the biological age is generated by using the body age, biochemical age, and hormonal age.

Therefore, the result database 150 stores the biological age together with the body age, biochemical age, and hormonal age, and the counseling guide is variable by the ages. The counseling guide includes measured biological age results and corresponding analysis and estimates, and may

further include corresponding anti-aging remedy.

In the above, the basic information database 140 and the result database 150 are separately installed, and the databases 140 and 150 can be combined into a single database and then managed since the measured age information stored in the result database 150 is measured based on the member basic data stored in the basic information database 140 and the additional data.

The database manager 160 performs a data input process, a data search process, and a data extraction process on the member database 120, the basic medical examination information database 130, the basic information database 140, and the result database 150 by control of the main server 110.

The clinical data database 170 stores test results measured for a plurality of domestic members for many years. For example, the clinical data database 170 stores very wide and complete test results of about 150 types including a health risk factor, body measurement, a body function, a biochemical test, a hormone test, an immunity function test, an oxidative stress test, a brain function test, and a sclerosis test based on 2,500 members for about 8 years.

The biological age estimator 180 estimates the biological age of the member who has requested to have his biological age be measured by referring to the clinical data database 170 based on the data stored in the

basic medical examination information database 130 and the basic information database 140 by control of the main server 110. In this instance, the biological age estimator 180 uses the biological age estimation formula that is generated by statistically analyzing the clinical data stored in the clinical data database 170 and estimates the member's biological age. The member's biological age generated by the biological age estimator 180 is stored in the result database 150 and the clinical data database 170 and is then managed to thus improve the accuracy of the biological age measurement formula by collecting further clinical data.

The settlement manager 190 settles the fee caused by using the biological age measuring service and stores settlement information by control of the main server 110.

Referring to FIG. 2 and FIG. 3, a biological age measuring service method according to an embodiment of the present invention will now be described in detail.

First, a user at a hospital accesses the biological age measuring device 10 through the terminal 22-1 to 22-m and 22-1' to 22-m' connected to the hospital server 20-1 to 20-n, or an individual user accesses the biological age measuring device 10 by using his terminal 40-1 to 40-p (S10).

For example, since the terminal 22-1 to 22-m and 22-1' to 22-m' connected to the hospital server 20-1 to 20-n is always connected to the main server 110 of the biological age measuring device 10 or is already

connected thereto by a private-use emulator in most cases, the user at the hospital can access the main server 110 through the terminal 22-1 to 22-m and 22-1' to 22-m', but the individual users cannot do as the user at the hospital does, and hence, the individual users performs a web browser at his terminal 40-1 to 40-p and inputs a domain name corresponding to the main server 110 or an IP (Internet Protocol) address thereto to thus access the main server 110 through the Internet 30.

The main server 110 access-requested by the user at the hospital or the individual user (both will be referred to as the user hereinafter) performs a web service function such as displaying a main screen for providing biological age measuring service to the user to thus perform the biological age measuring service (S20).

When the user receives a biological age estimation while the main screen is displayed (S30), the main server 110 displays a screen that requires the user's inputs so as to determine whether the user is a subscriber (S40). For example, a log-in screen for determining the user' registration status is displayed. Since the terminal 22-1 to 22-m and 22-1' to 22-m' is connected while the hospital is registered as a member, the above-noted process for determining the membership status can be omitted. Also, the process for determining the membership status can be omitted when the user previously logs in to the server to acquire membership authentication before the step S30 of receiving biological age measurement.

The user determines whether he is a subscriber (S50), and when he is not a subscriber, he registers himself again as a member for using the biological age measuring service according to a predetermined membership process and receives the biological age measuring service (S60). When the user is a subscriber, he inputs subscription information including an ID and a password (S70).

The main server 110 confirms that the user is a member by using the member database 120 managed by the database manager 160 according to the subscription information input by the user, and displays a reception and settlement screen (S80). FIG. 4 shows a reception and settlement screen displayed to the user.

Next, the user inputs his basic information to the displayed reception screen to provide a biological age measurement (S90) and requests to settle the used biological age measurement service (S100), and main server 110 stores reception information that is basic information input by the user and settles the fee of the biological age measurement service through the settlement manager 190 (S110). In this instance, the reception information includes a user name, a residence code, and a test date. Also, the fee is settled by no-bankbook deposit and a credit card.

Therefore, the process for measuring the actual biological age is started when the fee for the biological age measurement is finished.

First, basic information is needed so as to measure the biological age,

and the basic information requires basic data that is primary data and additional data that is secondary data. The basic data include risk factors, body measurement, and extra test results, and the additional data include biochemical data and hormonal data. In this instance, the basic data are known by the user or cane be easily tested by the user, and the additional data can be acquired through a test by a specific test authority, and hence, it is to be determined whether to receive results by requesting the additional data to the designated test authority, or to directly input the additional data for the case when the user already requested the test and possesses corresponding data.

Therefore, the main server 110 displays a screen for checking test request state so as to input additional data (S120), and when the user inputs an answer to the test request state to the corresponding screen (S130), the main server 110 determines the test request state (S140) and requests an external test (S150) for collecting additional data for the corresponding user when the answer for requesting the test is input, and it goes to the next stage by determining the answer to be a direct input when the answer is not an answer for requesting a test. FIG. 5 shows a screen for checking the test request state displayed to the user.

Next, the main server 110 displays a screen for inputting basic data from among basic information for measuring biological age to the user (S160), and when the basic data are input by the (S170), the main server

110 stores the basic data in the basic information database 140 managed by the database manager 160 (S180). In this instance, the basic data includes user information including a user name, a residence code, a test date, a progress state (settlement state), risk factors including a drinking type, a smoking type, an exercise type, a seat belt wearing state, an average sleeping time, and a past and present disease, body measurement, and extra test results. FIG. 6 shows a screen for inputting basic data displayed to the user.

When it is determined that the additional data are directly input in the step of (S140), the main server 110 displays a screen for inputting the corresponding additional data to the user (S190), and when the additional data are input by the user (S200), the main server 110 stores the input additional data in the basic information database 140 (S210). In this instance, the additional data include biochemical data and hormonal data, and the biochemical data include ABO and RH blood types, the number of WBC, the number of RBC, Hemoglobin, Hematocrit, MCV, MCH, MCHC, Platelet, PDW, the number of differentiation, and ESR, and the hormonal data include DM markers having fasting blood sugar, insulin, and HgbA1c, Thyroid markers having F-T3, F-T4, and TSH, endocrine markers having DHEA-S, cortisol, melatonin, and GH markers having growth hormone stimulus tests, IGF-1, and IGFBP-3.. FIG. 7 shows a screen for inputting additional data displayed to the user, and FIG. 8, FIG. 9 and FIG. 10 show

basic data and additional data input by the user.

When the request result is provided by the corresponding external authority after the test request in the step of S150, the result data are stored as additional data in the basic information database 140.

On collecting the basic data and the additional data of the user who is a biological age measurement receiver, the main server 110 displays a screen for showing data completion to the user (S220), receives a request for the data analysis from the user (S230), and measures the biological age for the corresponding user (S240). FIG. 11 shows a screen for displaying data collection completion and requesting data analysis displayed to the user.

The main server 110 controls the biological age estimator 180 in the biological age measurement step of S240 to measure the user's biological age. The biological age estimator 180 estimates the biological age by using the very wide and complete test results of about 150 types including a health risk factor, body measurement, a body function, a biochemical test, a hormone test, an immunity function test, an oxidative stress test, a brain function test, and a sclerosis test stored in the clinical data database 170 based on 2,500 members for about 8 years. That is, the biological age estimator 180 estimates the biological age generated by using a body age, a biochemical age, and a hormonal age, by applying the basic data and the additional data collected for the user having requested the biological age measurement to the biological age calculation formula that is generated by

analyzing a large volume of clinical data. In this instance, the biological age calculation formula is generated to have an excellent coefficient of correlation and explanatory power with high relativity of test items. In detail, the biological age calculation formula according to the embodiment of the present invention is generated through about 150 test results with 2,500 persons, its coefficient of correlation R reaches almost 0.77 and its explanatory power R^2 reaches almost 0.60.

Next, the biological age estimator 180 stores the user's measured biological age analysis result in the result database 150 through the database manager 160, and concurrently displays the result and a corresponding guide to the user (S250). The biological age analysis result includes a chronological age, a measured biological age, an age comparison graph, body ages, a chemical age, a hormonal age, and a corresponding graph. Also, the counseling guide includes measured biological age results, corresponding analysis and estimation, and it may further include anti-aging treatment including, for example, changes of lifestyle such as diet and exercise, hormonal treatment, antioxidant prescription, and immunity reinforcing treatment. FIG. 12 shows an analysis result screen displayed to the user. Further, the analysis result may include a guide item for next measurement.

The biological age estimator 180 measures the user's biological age to find a result according to the corresponding biological age calculation

formula when the data for the user's biological age measurement, that is, basic data and additional data are input.

While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

For example, it is described in the above that the basic data and the additional data for the user having requested the biological age measurement are input, and the steps S160 and S170 for directly inputting the basic data may further include receiving medical examination information including survey data on the user. The data are stored in the basic medical examination information database 130 managed by the database manager 160.

In addition, the accurate biological age measurement method is applicable to general examination, regular health test, climacteric test, obesity test, and general outpatient examination.

【INDUSTRIAL APPLICABILITY】

According to the embodiment of the present invention, very cheap and very accurate biological age measurement is allowed.

Also, biological age measurement with excellent coefficient of

correlation and explanatory power is allowed because of high relativity of test items.

Further, each person's aging degree can be detected by accurately measuring his biological age. Therefore, anti-aging treatment effects can be accurately determined.

Also, each person's biological age is repeatedly measured and managed so that his aging progress is detected and a treatment for delaying the aging is allowed.

The persons can live a healthy life by the aging delaying process and the anti-aging process.

[CLAIMS]

1. A device for measuring a biological age and providing the same to a user connected through a network, comprising:

a database for storing information including user data for measuring a biological age;

a database manager for performing a database management operation including an operation for storing data in the database, an operation for searching data, and an operation for extracting desired data;

a biological age estimator for measuring the user's biological age by using user data stored in the database, the user having requested biological age measurement;

a settlement manager for settling the fee used for the biological age measurement service; and

a main server for collecting the user data used for biological age measurement, controlling the database manager to store the user data in the database, controlling the biological age estimator to use the user data stored in the database to measure the user's biological age, and controlling the settlement manager to settle the fee of the biological age measurement service.

2. The device of claim 1, further comprising a clinical data database, connected to the biological age estimator, for storing a plurality of

test results applied to a plurality of persons for a plurality of years as clinical data.

3. The device of claim 2, wherein the biological age estimator estimates the biological age by using a biological age calculation formula that is generated by statistically analyzing the clinical data stored in the clinical data database.

4. The device of claim 3, wherein the clinical data include a health risk factor, body measurement, a body function, a biochemical test, a hormone test, an immunity function test, an oxidative stress test, a brain function test, and a sclerosis test.

5. The device of claim 3, wherein the biological age calculation formula is generated for respective items of the clinical data to have a high coefficient of correlation and explanatory power.

6. The device of claim 1, wherein the database comprises:

a member database for storing basic information on a registered member who enters a predetermined membership process so as to use the biological age measurement service;

a basic information database for storing user's basic information used

for biological age measurement; and

a result database for storing information including a measured biological age result.

7. The device of claim 6, wherein the basic information comprises:

basic data including reception information on the user to be input by the user, a risk factor, and an extra test result; and

additional data including biochemical data and hormonal data tested by a predetermined test authority.

8. The device of claim 7, wherein the risk factor includes a drinking type, a smoking type, an exercise type, a seat belt wearing state, an average sleeping time, and past and present diseases.

9. The device of claim 7, wherein the biochemical data include a blood type, the number of WBC, the number of RBC, Hemoglobin, Hematocrit, MCV, MCH, MCHC, Platelet, PDW, the number of differentiation, and ESR.

10. The device of claim 7, wherein the hormonal data include DM markers having fasting blood sugar, insulin, and HgbA1c, Thyroid

markers having F-T3, F-T4, and TSH, endocrine markers having DHEA-S, cortisol, melatonin, and GH markers having growth hormone stimulus tests, IGF-1, and IGFBP-3.

11. The device of any one of claim 1 to of claim 10, wherein the biological age comprises:

a body age for indicating the user's body age;

a biochemical age for indicating the user's biochemical factor age; and

a hormonal age for indicating the user's hormone factor age, and

the biological age is generated by using the body age, biochemical age, and hormonal age.

12. The device of claim 11, wherein the biological age result comprises:

comparison contents of the user's chronological age and the measured biological age;

the user's body age, biochemical age, and hormonal age; and

a counseling guide including analysis and estimation for the measured biological age, body age, biochemical age, and hormonal age results.

13. The device of claim 12, wherein the counseling guide comprises an anti-aging treatment for the measured biological age.

14. The device of claim 13, wherein the treatment includes changes of lifestyle including diet and exercise, hormonal treatment, antioxidant prescription, and immunity reinforcing treatment.

15. The device of claim 1, wherein the user's biological age is periodically measured and the measured biological age result is accumulatively stored in the database to measure the user's aging rate.

16. A biological age measurement servicing method for measuring a biological age and providing the biological age to a user connected through a network, the method comprising:

a) collecting basic information on the user when the user requests biological age measurement;

b) measuring the user's biological age by using the collected basic information; and

c) displaying the biological age measurement result to the user.

17. The method of claim 16, wherein in the step b), the biological age is estimated by using a biological age calculation formula that is

generated by using a plurality of test results tested to a plurality of user for a plurality of years as clinical data and statistically analyzing the test results.

18. The method of claim 16, wherein the basic information comprises:

basic data including reception information on the user that is directly input by the user, a risk factor, and an extra test result; and

additional data including biochemical data and hormonal data tested by a predetermined test authority, and

the step a) comprises:

i) determining whether to request an external test authority to collect additional data on the user;

ii) directly receiving basic data on the user from the user;

iii) directly receiving additional data on the user from the user when no request is provided to the external test authority;

iv) providing additional data on the user to the external test authority when a request is provided to the external test authority.

19. The method of claim 18, wherein further comprising, before the step of i), settling the fee for the biological age measurement service.

20. The method of claim 18, wherein when the collected basic

information on the user is stored in a predetermined storage unit in the step a), the basic information on the user stored in the predetermined storage unit is used to measure user's biological age in the step b).