ON-LINE SYSTEM FOR GENERATING INDIVIDUALIZED TRAINING PLANS

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Appl. No.: 13/422,968
Filed: Mar. 16, 2012

Publication Classification

Int. Cl. A63B 69/00 (2006.01)

ABSTRACT
The internet based training system creates an individualized training plan designed to achieve a particular training purpose and delivers the plan to the individual user or athlete via the internet. The training system includes a local user interface and a remote server accessed via the internet. The remote server includes a computer program and a number of databases containing team information, athlete information, exercise information and training programs associated with specific training purposes such as a specific sport or activity. An algorithm is used for determining the weight of each exercise to be performed for each period in the training cycle of a particular training program. The computer program automatically creates a specific training plan using information from the databases and the weight determined by the algorithm.
The Team Database holds all information associated to the team.
- Team Name
- Sport
- Season dates
- Facilities info

The User Database holds all information associated to a user account.
- Account data
- Billing data
- Athlete data
- Athlete history

The Training Program Database holds the training programs for each sport.
- Defined list of exercises
- When to perform each exercise

The Exercise Database stores the individual exercise data.
- Coaching points
- Required equipment
- Data for calculating intensity

The User Interface interacts with the User Interface to manage one or more athlete profiles, manage team profiles and to access the training plans.

The Training Plan Builder is a computer program that uses data from the 4 databases, data from the the Exercise Intensity Algorithm and data from the request from the UI to assemble the training plan and return to the UI.

The Exercise Intensity Algorithm uses exercise data and user data to calculate the intensity for each set of each exercise in each season/phase/day.
Select Program: The system uses the team data to select the appropriate training program from the Training Program Database.

Pull Exercise Data: The system pulls exercise data for each of the corresponding exercises in the training program.

Pull Team Data: The system pulls data for the team that the athlete is on from the Team Database.

Pull Athlete Data: The system pulls athlete profile data from the User Database.

Calculate Intensity: The athlete and exercise data is run through the Exercise Intensity Algorithm to calculate the intensity for each of the exercises.

Return Training Plan: The training plan is assembled using data from the 4 databases and returned to the UI.
ON-LINE SYSTEM FOR GENERATING INDIVIDUALIZED TRAINING PLANS

TECHNICAL FIELD

[0001] This invention relates generally to a system for generating athletic and fitness training plans, and more particularly concerns such a system which includes individually adapted exercises and intensities thereof related to particular sports and fitness activities.

SUMMARY OF THE INVENTION

[0002] Accordingly, the internet-based training system for athletes comprises: a user interface; a training program database which stores at least one training program, comprising a series of preconfigured exercises; an exercise database comprising a plurality of individual separate exercises and selected information, if any, relating to each exercise; an exercise algorithm for determining exercise intensity to be used for each exercise in the training program; and a computer program for determining automatically, following initiation, a training plan for an individual athlete based on input data about the individual athlete, training program data from the training program database, exercise data from the exercise database and the exercise algorithm, wherein the computer program provides back to the user the training plan, wherein the training program database, the training program database, and the exercise database are at a remote location, wherein the communication with the user interface occurs over a computer network.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIG. 1 is a flow chart showing the components of the training system, including a user interface portion.

[0004] FIG. 2 is a block diagram of the major components of the training system.

[0005] FIG. 3 is a flow chart showing the sequence of functions of the training system.

BEST MODE FOR CARRYING OUT THE INVENTION

[0006] The training system includes a local user interface with an internet capability in combination with a server with several database portions at a remote location. The training system includes the ability to input individual and team data including initial and on-going strength data and to obtain from the remote server an appropriate training plan.

[0007] In general, the outcome of the training system is an individual athlete-focused training plan but can include a plurality of individual plans for athletes comprising an entire team which will typically be overseen by a coach. An “athlete” is herein defined as any individual for whom data, including strength data, is provided to the system and who actually performs the exercises contained in the training plan. A “coach” is herein defined as any individual who oversees the performance by the athlete or athletes of the exercises contained in the training plan. The system is based on a predetermined set of exercises designed for a specific training purpose, e.g. performance in a specific sport, with the intensity of the exercises being based on strength feedback information from the individual athlete. The individual plans are typically based on a year-long cycle or time period relating to the timing of the specific sport season.

FIG. 1 shows the major components of the system, referred to generally at 10. The system includes a local user interface 12, which is accessible to a user, such as a coach or individual athlete, and a remote server 13. The user interface 12 can be located at a personal computer or similar device, typically, but not necessarily, at the training facility of the team/user. Basically, the user interface 12 is presented to the user through a web browser or other similar application. The user interface 12 has three significant functions. First, it is available for data input, including information concerning a team as well as the individual users. This information is stored at 14 and 16, respectively. Team database 14 will store all relevant team information that has been inputted by the user through input 18. Referring to FIG. 2, the team information will include, but is not limited to, the sport played by the team, the team name, the profile of the facility, including a description of the workout equipment, information about the coaches, information about the players, including the names of the players, the position of each player on the team, and the season start and end dates.

[0009] A user (athlete) database 16 receives input information for individual athletes, including but not limited to, data concerning the athlete’s individual account, the billing data and the profile data concerning the athlete, including the height and weight of the athlete, as well as the certain athletic test results, including strength information.

[0010] The user interface also includes a request function/input for a training plan, shown at 24, which can be operated once the team and athlete information has been entered. The request is directed to a training plan computer program in the remote server, referred to as training plan builder 26. This program in operation obtains data from the user and team databases 14 and 16 as well as information from a training program database 32, an exercise database 30, and an exercise intensity algorithm 34 to construct a comprehensive training plan. The training plan is provided back to the user interface at 24. The user interface then typically displays the plan at 27.

[0011] The exercise database 30 stores a large number of specific separate exercises. The exercises in database 30 are preconfigured, static and cannot be changed by inputs to the team and user database by the user. The exercises stored in database 30 are not per se associated with a particular sport or body part in the database. The exercise data will typically include the recognized name of the exercise, as well as a short explanation of the exercise and how to perform it, the equipment required to perform the exercise, as well as other coaching points. In some cases, an alternate exercise is provided, such as to accommodate an injury or in the event that the designated equipment is unavailable. For each exercise, there is number data, i.e. sets or reps, as well as data for calculating the intensity, i.e. weight, for each set. In this embodiment the content of the exercise database cannot be altered by the user, however, alternative embodiments may allow for users to preconfigure exercise data.

[0012] The training program database 32 stores preconfigured (preset) training programs. It includes all of the different preconfigured training programs in the overall system. The training program database could include the exercise database. A training program consists of a subset of exercises existing in exercise database 30 particularly arranged to achieve a specific training purpose. Each training program is loaded into the database as a static program, i.e. it cannot be changed by inputs to the team and user database by the user. Each training program so loaded is associated with a specific...
sport and includes a particular preselected array of exercises for the athlete to perform, as well as when they are to be performed (time schedule) and in what sequence. There will be preferably one training program per sport. In the present embodiment, the content of a training program cannot be altered by the user, however, alternative embodiments may allow for users to change the configuration of a particular training program by changing the number and/or the particular exercises in the program or the intensities thereof.

[0013] The exercise intensity algorithm 34 uses data from the exercise database and user input data to calculate the intensity (the weight) for each set of a selected exercise in each season/phase/week/day of training, as discussed in more detail below. As the user periodically inputs new data, new intensity numbers will be created by the intensity algorithm. The algorithm in the present embodiment is:

\[
\text{Intensity} = (\text{base exercise} \times 1 \text{ RM}) \times (\text{load %}) \times (\text{intensity %})
\]

[0014] 1 RM (one rep maximum) refers to the maximum weight lifted by the athlete for a single rep of a preselected base exercise. Typically, each exercise in the exercise database 30 has one associated base exercise; for example, the base exercise for the incline press is the bench press. The preferred embodiment of each sport’s training program includes three to five pre-established base exercises. However, in some sports, fewer than three or more than five base exercises may be used. For example, the base exercises for the football training program are the bench press, the back squat, the hang clean, the push jerk, and the deadlift.

[0015] The load percentage refers to the percentage of the base exercise 1 RM that would approximately be the maximum weight lifted by the athlete for a single rep of the selected exercise. For example, the load percentage of the incline press (selected exercise) is 80% of the bench press (base exercise). This estimates that the athlete’s incline press 1 RM is 80% of the athlete’s bench press 1 RM.

[0016] The intensity percentage is based on the point within a specific training program that the exercise is to be performed. Each exercise has a defined intensity percentage for each point in the training program that it might be performed. For example, the intensity percentage for the bench press in the first set of the first week of the first phase of the football training program is 55%. The intensity percentage will thus vary throughout the program.

[0017] The outcome of the algorithm is a specific intensity (weight) of a specific exercise to be performed by a given athlete at a given point in a specific training program.

[0018] The comprehensive plan builder 26 is a computer program that uses data from the four databases (14, 16, 30, and 32) and the exercise intensity algorithm 34 to assemble a training plan, in response to a request from a user through the user interface 24.

[0019] The system can be accessed by a user, such as an athlete, to obtain a training plan for a selected sport or accessed by a coach to obtain plans for multiple athletes on a team. FIG. 3 shows the overall process of the system, which operates only after the team data and athlete data have been previously entered into their respective databases. The first step in operation of the system is shown at 40, which is a request for a training plan from a user for a particular sport for an entire team or for an individual athlete. The request can be initiated through user action, or the request can occur automatically, such as at a particular time of year. The request is directed from a local computer station/terminal to the server at the remote location over a computer network such as the internet. The remote server contains the training plan builder 26, the four databases (14, 16, 30, and 32) and the intensity algorithm 34. In the preferred embodiment, the databases are separate and number four; however, in other embodiments, the databases may be combined or further divided to a number fewer than or greater than four.

[0020] In step 42, training plan builder 26 obtains data from team database 14 for the team which includes the athlete for whom the plan is being constructed. Typically, the team data obtained will include, but is not necessarily limited to, the sport or the team that the particular athlete is on, and a series of dates pertinent to the schedule of the sport/team for the given year, and any relevant facilities data. In the next step, shown at 46, the plan builder 26 uses the team data to select an appropriate preconfigured training program from the training program database 32. For example, if the sport selected is football, a football program is selected and obtained from the database 32. As indicated above, a training program is a set of exercises for a particular athlete to perform, including when they should be performed and in what sequence. The training program does not include information concerning the volume (sets/reps) or intensity that should be used for each exercise.

[0021] In the next step, shown at 48, specific exercise data is obtained from the exercise database 30 for each of the exercises in the selected training program. This data will include, as indicated above, the name of each exercise, the description of each exercise (including pictures, diagrams or video), any coaching points, the volume (sets/reps), and the numbers used for the intensity calculation.

[0022] In the next step at 50, data is obtained from the user database 16 for the individual athlete. This data includes athlete profile data, the performance of the athlete in initial strength tests such as the 1 RM data, and any injury data.

[0023] In the next step 52, the intensity (weight) of each exercise in the selected program is produced from the athlete data and the exercise data, using the exercise intensity algorithm 34 described above. The intensity algorithm is used only for the purpose of determining recommended weights to be used for the various exercises and does not affect the training plan in any other way. Intensity is calculated independently for each exercise.

[0024] The actual training plan for the individual athlete is then assembled, as shown at 54 and then provided back to the user through the user interface. The plan itself can be viewed at the user interface, or it can be exported to another device or printer.

[0025] The end result of the system is a training plan which can be sport-specific, which includes a set of exercises which are predetermined, static, and unique to each sport. Each such training plan is typically directed toward a year-long training cycle, broken down into seasons, phases, weeks, and days. Each season, phase, week, and day (or other period) is designed to accomplish specific goals and, in combination, produce a comprehensive annual training plan.

[0026] The training cycle refers to the entire year of an athlete’s training from the beginning of the off-season to the end of the post-season. Each annual training cycle will typically consist of four or five individual training blocks typically comprised of four or five phases. Each training phase is a group of weeks, typically two or three, or other short periods that share a common exercise regimen but vary in intensity in
accordance with the exercise intensity algorithm. The duration of a training phase may be several weeks, one week or several days.

Each training program for a particular sport and the exercises thereof comprising the training program is designed in accordance with specific movements associated with the athletic performance of that sport, not necessarily particular muscles or body parts. Each daily training regimen includes, but is not limited to, a resistance-based warm-up, an explosive or rapid movement, resistance training, injury prevention movements, and speed/agility training. The program uses a specific, unique schedule for each sport and each individual athlete that determines the timing of each training season, phase, and week in accordance with the start date and end date of the sport season.

Accordingly, an on-line system for generating individualized training plans has been disclosed which utilizes a significant amount of specific information, much of which is fixed for each sport, but is broken down into a particular time sequence to achieve improved sports performance.

Although a preferred embodiment has been disclosed for purposes of illustration, it should be understood that various changes and modifications and substitutions could be made in the preferred embodiment without departing from the spirit of the invention as defined by the claims which follow:

What is claimed is:

1. An internet-based training system for athletes, comprising:
   a user interface;
   a training program database which stores at least one training program, comprising a series of preconfigured exercises;
   an exercise database comprising a plurality of separate exercises and selected information, if any, relating to each exercise;
   an exercise algorithm for determining exercise intensity to be used for each exercise in the training program; and
   a computer program for determining automatically, following initiation, a training plan for an individual athlete based on input data about the individual athlete, training program data from the training program database, exercise data from the exercise database and the exercise algorithm, wherein the computer program provides back to the user the training plan, wherein the computer program, the training program database, and the exercise database are at a remote location, wherein the communication with the user interface occurs over a computer network.

2. The system of claim 1, wherein initiation of the computer program and the providing of the training plan occurs through the user interface.

3. The system of claim 1, wherein the training program database stores a plurality of training programs.

4. The system of claim 2, wherein the training programs are associated with performance in specific sports.

5. The system of claim 1, including a team database containing information about a team which comprises a plurality of individual athletes.

6. The system of claim 1, including an athlete database containing information about individual athletes, including exercise strength information performed by the athlete or estimated by the athlete or other user.

7. The system of claim 1, wherein each program includes a training cycle which covers in-season and out-of-season time periods.

8. The system of claim 7, wherein the training cycle is one year.

9. The system of claim 1, wherein the exercise intensity determined by the exercise intensity algorithm is adjustable in accordance with adjustments in input strength data from the athlete.

10. The system of claim 9, wherein the input strength data correlates to performance or estimated performance of base exercises in the training program.

11. The system of claim 7, wherein the training cycle comprises a plurality of training blocks which are comprised of a plurality of training phases which in turn are comprised of weeks which vary in intensity.

12. The system of claim 11, wherein a single training phase covers a one to four week exercise regimen.

13. The system of claim 12, wherein a single training week comprises 2-5 days of exercises.

14. The system of claim 3, wherein each training program includes 3-5 base exercises.

15. The system of claim 1, wherein the exercise intensity algorithm incorporates a one rep maximum weight actually performed or estimated for the athlete for one or more selected exercises.

16. The system of claim 1, wherein the exercise algorithm is:

   \( \text{Intensity} = \left( \text{RM} \cdot \text{Load} \cdot \text{Intensity} \right)^{0.3} \)

17. The system of claim 1, wherein the preconfigured exercises include specific body movements associated with a selected training purpose.

18. The system of claim 1, wherein the training plan includes a resistance-based warm-up, explosive movements, resistance exercises, injury prevention movements, and speed/agility exercises.

19. The system of claim 1, wherein the preconfigured exercises for the training program are selected by the user.

20. The system of claim 1, wherein the separate exercises in the training program are configured by the user.

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