

Research on Fitness APP

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Keywords: Fitness app; Model design; C—SVC; V—SVC

Abstract: With the advent of mobile Internet, fitness apps have swept the whole society and have had a profound effect on people's exercise behavior. The sports apps promoted people's exercise behavior and habits significantly. It can exercise anytime, anywhere, on-demand occurs and also life-long fitness. Through the good experience of fitness app and interactive perspective, elaborate design and based on needs analysis and basic principles of the possible model designed to discuss the content, combined with c-svc and v-svc data analysis to illustrate, intended departure from the bodybuilder needs to optimize fitness APP is designed to improve the current shortcomings of the fitness of APP, it is part of the construction of a simple model to try, for research reference. Development of rich sports information on the Internet and information network technology, scientific guidance of public health provides a practical way to a variety of sports sites such as springing up, major portals and various comprehensive website. It also is regarded as an important part of sports channels to run the site. But the study found that relying on the guidance of the fitness aspect of network resources is not satisfactory. Studies show that there are too many problems on health services network: the lack of standardized information collation, the query time-consuming and labor-intensive; the lack of development, and professional fitness guide website. People do not refer to sex high, technical barriers, and low-level database. It is difficult to achieve interconnection sharing, and it lacks of personalized and proactive services [1].

In recent years, researches on Physical Education under the information environment have become quite popular. With the rapid development of mobile Internet, the application of 4G mobile communications technology and data technology as the core of the network technologies, smart phones are becoming more and more popular, and the fitness software in the smart phone has become an important tool for their physical exercise. The function of fitness software in the smart phone is simple, free, powerful, and it has great application prospects in fitness. At present, there are a variety of fitness app markets. However, the widespread content is boring, the logical is confused, the production is rough and also some other shortcomings. the reason is not really from the perspective of users and fitness to design and research[2]. In order to solve these problems, based on the analysis of physical fitness app demand, this article attempts to embark from the perspective of fitness and further exercise of APP structure model and function module design, combined with c-svc and v-svc data analysis to illustrate the Android development process based on the main idea of the algorithm used to improve and promote the fitness results.

1. Design Concept

The operation of logic, interface interaction, user experience and other aspects of the design needs to be taken into consideration. However, for users, the most intuitive feeling is UI APP, the most useful is the interface interaction. After all, media interface interaction level directly affects the athletes' exercise motivation and enthusiasm, thereby affecting the app and the effect of exercise; and for the designers, interaction level reflects the concept and advantages of the interface best, which indicates the designer's thinking and visible interface design function. So in order to realize the optimization of extracurricular sports fitness app, the most fundamental way is to achieve reasonable and reliable interactive interface, to meet the real needs of users. Firstly, the interface's

sense of understanding should be enhanced, so that users can feel APP even if the delay occurs and also enhance the user's sense of trust and use. Second is to optimize the UI element. UI is the user's most intuitive and strong sense of the overall APP and a user-friendly UI is often more attractive to attract users. Third, attention should be paid to the app sharing, all the user'd information and usage can be saved through just one account whether it is in the smart phone or tablet, reducing the user's inconvenience of information processing. Fourth, the application of technical advice should be taken into consideration. Persuasive technology is the design of user intent. The user behaviors and activities are accurately observed through the sensor and detection technique of smart mobile devices. After obtaining a mass of users physiological data index in the intelligent equipment, reasonable and effective information should be conveyed to the users in appropriate time, to guide the user's appropriate behaviors, alert and help improve the unhealthy way of life to achieve the goal of persuasion.

2. Model Construction

Abstractly, different from three elements in traditional tutoring research "coach, individual, motion", the app is based on "sports fitness, fitness community, app server of learning" , to realise the three pairwise two-way interaction. Besides, the exercise and fitness community is the core of the whole exercise, playing a user role, and app learning server is to provide a variety of services to users, and users will be the use of feedback information to the server. The app will continue to optimize and upgrade, offering mutual benefit. Therefore, we need to focus on a new way of thinking and perspective, as shown in Figure 1.

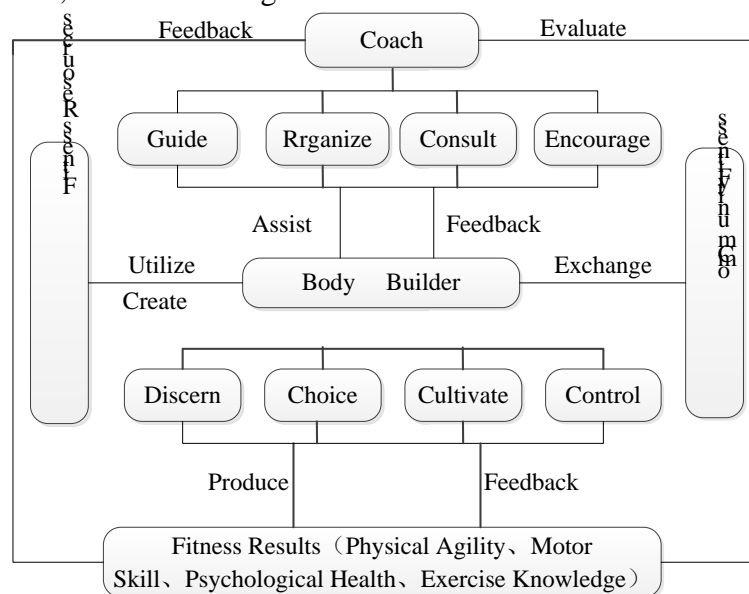


Fig 1. The elements of fitness APP model

Overall, the structure of the APP consists of three parts: "the bodybuilder", "the community" and "the fitness server". "the bodybuilder" and "the community" are the users, "the fitness server" is to provide a variety of services to users. At the same time, fitness app server is composed of data, interactive, training, system evaluation and so on. Data center is used to store the latest fitness information and some of the auxiliary fitness data, so it is a huge data base. Fitness center is a link, which connects the fitness center with each other. The fitness center can interact and communicate with the body building community through interaction center. Personal center is a platform to help users manage their personal information. Health evaluation consists of two parts: self assessment and evaluation of coach, so that individual can evaluate the fitness results timely and accurately, effectively test their fitness results, significantly enhance the users' confidence in bodybuilding and their learning effect.

3. Module Design

The fitness app structure model is shown in Figure 2. The fitness app is composed of seven modules, namely "fitness service, experience, interaction, motion records, information, announcement and test". Module service can provide personalized settings, such as head, nicknames, etc., to increase the students' interest, and "experience, interaction and motion record" three big modules must be used to improve the fitness effect. "information, announcement and test" module provides personalized fitness guide, which can, for example, import fitness goals, access to information of fitness and evaluate fitness effect and information feedback of the modules from the "information and announcement". Therefore, the module has a unique function, but also with the rest of the other linked to a common role in the fitness APP.

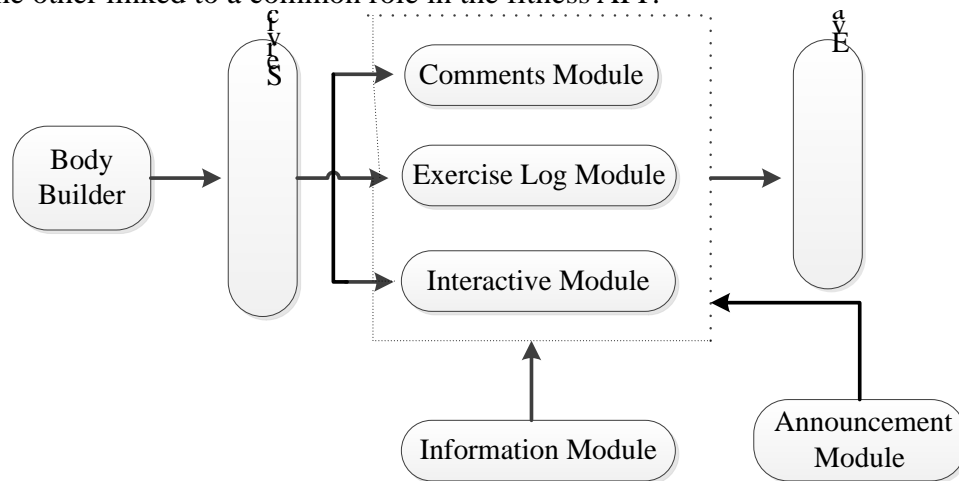


Fig 2. The model of fitness APP

The relationship between the seven modules in Fitness APP is inseparable and their respective unique functions complement each other, constituting a complete fitness APP ecosystem. According to their own conditions and needs, bodybuilders can choose module for personalized content, while the entire functional module design is complete, such as Figure 3.

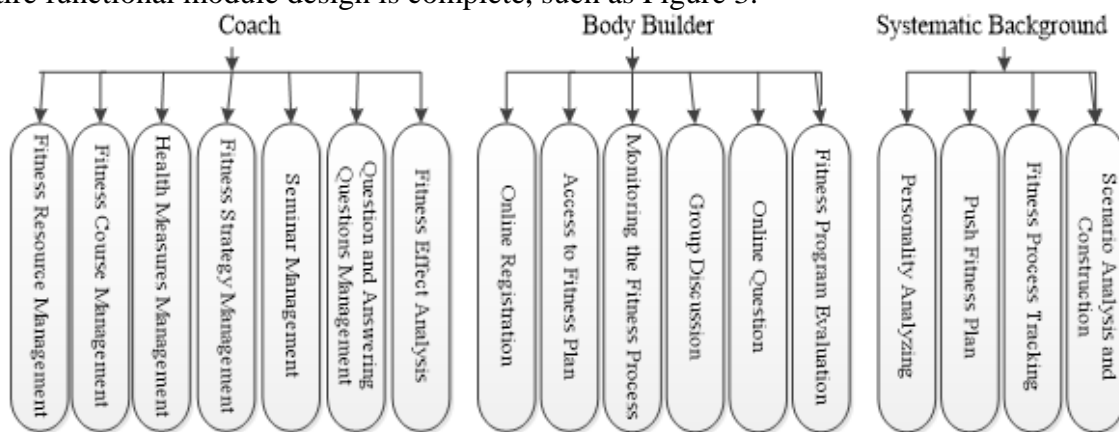


Fig 3. The functional module of fitness APP

4. Platform Implementation Strategy

On the one hand, we set the standard threshold for users to search for information, so as to provide accurate contour features, namely the customer information required. Another feature detection sample and accurate information of the deviation from the value range:

If the deviation value is less than the threshold, correct;

If the deviation value is greater than the threshold, error.

The following is a C-(the Support vector classification) SVC and V-(Support vector classification) SVC research data analysis:

The first C- SVC method:

Setting training sample data: $\{z_i = (x_i, y_i)_{i=1}^n\}$, $x_i \in R^d$, $(1 \leq i \leq n)$, $y_i = \{\pm 1\}$, The formula for the initial problem of C - SVC is expressed:

$$\min_{w,b,\xi} \frac{1}{2} \|w\|^2 + c \sum_{i=1}^n \xi_i \quad s.t. \quad y_i(w\phi(x_i) + b) \geq 1 - \xi_i, \xi_i \geq 0, 1 \leq i \leq n \quad (1)$$

With the problem of the dual problem can be expressed as the following form:

$$\min_a \frac{1}{2} aQa - ea \quad s.t. \quad ya = 0, 0 \leq a_i \leq c, 1 \leq i \leq n \quad (2)$$

We get Q to be $n \times n$ rectangular square by formulas and sample data,

Showed the formula (2) expansion is derived, finally get users fitness data information of decision function:

$$\text{sgn}(w\phi(x) + b) = \text{sgn}\left(\sum_{i=0}^n y_i a_i k(x_i, x) + b\right) \quad (3)$$

The second of V-SVC methods:

V—SVC is a common support vector based strategy, there are parameters v. Its advantage and function is that it can effectively reduce the number of vector bases, To reduce processing data and improve the accuracy, speed of operation. Setting training data samples: $\{Z_i = (x_i, y_{i=1}^n)\}$, $x_i \in R^d$ $(1 \leq i \leq n)$, $y_i \in \{\pm 1\}$. The starting problem of V - SVC can be expressed as a formula:

$$\min_{w,b,\xi,p} \frac{1}{2} \|w\|^2 - vp + \frac{1}{n} \sum_{i=1}^n \xi_i \quad s.t. \quad y_i(w\phi(x_i) + b) \geq p - \xi_i \quad (4)$$

The range of V in the formula is $[0,1]$, the dual problem and its corresponding formula:

$$\min_a \frac{1}{2} aQa \quad ya = 0, ea \geq v, 0 \leq a \leq \frac{1}{n}, 1 \leq i \leq n \quad (5)$$

Among $Q_{ij} = y_i y_j k(X_i, X_j)$, The kernel function of it is $K(X_i, X_j) = \Phi(X_i) \Phi(X_j)$, Finally, decision function of user fitness data information were obtained by formula (5) to expand:

$$\text{sgn}(w\phi(x) + b) = \text{sgn}\left(\sum_{i=0}^n y_i a_i k(x_i, x) + b\right) \quad (6)$$

The platform has a lot of data to be trained. The redundancy and repetition rate of the data to be processed is also very high, causing a waste of time on the management of the platform. At the same time, excessive data results in more difficult algorithms and lower accuracy, making it difficult to achieve both standard and expected results. For a better improvement, data processing algorithm mentioned above can effectively compress the original training samples, analyze the sample data, improve the rationality of the selected samples, reduce the algorithm time, reduce the difficulty of the algorithm, and greatly improve the accuracy of the algorithm, thus providing users with the resources they want, so that users can easily access the scientific fitness guide anytime, anywhere.

5. On-Line Synchronization Algorithm

If the user continues to use the platform to obtain services, they will be confronted with the following questions: First, the system will analyze the historical data, thereby enhancing the user

experience and the degree of satisfaction; Second, if the data samples increased, the algorithm will be calculated, which leads to a misjudgment of data. Therefore, this paper will focus on the principle of forgetting mechanism [4], and propose that, compared with the previous many algorithms, the corresponding algorithm can better adapt to the increasing data sets for the huge data calculation has a very good effect. The main principles are as follows: First, Use the C-SVC and V-SVC training samples to obtain valid samples. Secondly, through the algorithm, with SVM, can not be removed to support the vector data, thereby improving efficiency.

The steps for the specific algorithm are as follows:

Step1: We choose the scientific fitness data set, we get $S = \{X_1, X_2, \dots, X_N\} \in R^d$, the annotation set $Y_1 = \{-1, +1\}$, $1 \leq i \leq N$, S_+ , S_- Is empty set;

Step2: The data set S needed by the learner is compressed efficiently and efficiently by C-SVC and V-SVC, and $S_0 = \{X_1, X_2, \dots, X_m\}$, $m < N$;

Step 3: Substituting $S_0 = \{x_1, x_2, \dots, x_m\}$, using SVM algorithm to deal with QP problem, get the training set of samples corresponding to the hyperplane set;

Step4: Then the new training sample vector X_q . (Z_q), if $\phi(Z_q)$ is marked as a positive number, the sixth or seventh step of the algorithm can be directly performed.

Step5: Calculate the value d , which represents the distance between X_q and the hyperplane. If the distance between the two is less than $1 + \varepsilon$, then $S_+ = S_+ \cup \{\phi(Z_q)\}$ is obtained;

Step6: Calculate the value d , which represents the distance between X_q and the hyperplane. If the distance between the two is greater than $1 + \varepsilon$, then $S_- = S_- \cup \{\phi(Z_q)\}$ is obtained;

Step 7: If S_+ , S_- in the sample elements are more than the size of the threshold, then give up S_0 in the non-support vector base, and then S_+ , S_- sample elements assigned to S_0 , S_+ , S_- And then turn to the third step.

6. Conclusion

Based on the advantages of SVM in less data processing, this paper compares the C-SVC and V-SVC effective training samples. This helps the Android smart phone interactive system platform problem detection function optimizes with less error message interference. Mobile fitness software application in the physical exercise can not only provide a scientific guidance to Popular fitness, but also help regulator to accurately determine whether people participate in physical exercise attentively, urging the effect of Public Health. Besides, it is conducive to the actual situation of the analysis of Public Health, providing basis for a more specified reasonable fitness service system.

Acknowledgment

Project Source: First-class Professional Construction Project of School-level Software Engineering; Provincial Advanced Language Programming Team.

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