

# The Exploration of the Construction of Athletes' Physical Function Digital Archives

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## Abstract

Physical function's digital archive, principally consisting of basic personal information and evaluation information, is the management process of body functional standard and scientific record, which makes it easy for sports teams and sports Research Institute to compile and use the digital files. Functional digital archive has distinctive dependence and the indiscernible, high density of data accumulation and store, transmission of shortcut, information intelligent retrieval, dissemination of intelligence, sharing of information resources and so on. Its requirements in standards, test method, recording method, recording and upload format for uniform and management modes take into account authorization and security.

**Keywords:** *body function; Physical function; Digital archives; athletes information.*

## 1. Introduction

China is a big sports country in the world, appearing many outstanding athletes. However, compared the other powerful country of sports, we are far backward on collection and management of the athletes information. In addition to the data of each team members of different events conserved by the State Sports General Administration, the other elite sports' data are grasped by the local coach, basically there is no perfect database system. Generally, the athletes' data are recorded by hand, both labor-intensive and inconvenient, but also easily lost, that is not benefit for the long-term preservation and operation of the information. Therefore, it is extremely important to establish the comprehensive database system.

Physical function's digital archive is experiencing functional management (basic information, physique, physical function, and so on), process specifications and scientific records. Physical function's digital archive takes the indexes of various body functions as the core. It

monitors the whole process of sports and covers all factors related to body functions. Thus, the information is presented in a multi-channel and dynamic way, which satisfies the need for scientific fitness and information resources demanded by professional sports teams and sports Research Institute involved in body morphology and functional data management.

Digital archival information has rich levels and various styles characteristics. Digital archival data here refers to the information that can be successfully transmitted by the internet environment. Digital information resources are collectively referred to as electronic resources. The digital archive takes mainly the electron as a carrier to achieve the purpose of the literature data storage, recording and transmission, and utilization by computer operation. Of course, the digital archive of information there are also some dependence which depend on the management of computer systems.

## 2. Purpose of physical function's digital archive

Firstly, Digital files save both time and manpower, while they can ensure data integrity, security and reliability. Secondly, the database can save the data of elite athletes for a long time, which reserves material for the sports science research. Thirdly, that is able to facilitate for the coaches of the athletes to understand athletes and to select the potential or more suited to their own athletes, so that the selection is accuracy. Lastly, it is a long training period to cultivate a good athlete, and it is a practice process which involves multi-disciplinary knowledge and theory. Through this process, we can learn from athletes growing series of changes observed phenomenon. What is the relationship between these phenomena and the future achievements of athletes? This is one of the most important problems in scientific selection, scientific training and scientific management. Only through quantitative

analysis on changing phenomenon to quantify, in-depth nature of the phenomenon, through the secondary unfixed contact, the main fixed contact will be revealed, and at last the law in the process will be found.

The vertical comparison: the athletes training of effect and shortcomings can be obtained through comparisons the data of athletes in different periods. The horizontal comparison: general athletes can improve the training and training methods through the understanding of the data of the top athletes. Therefore, from the point of theory and the practical application, it has an important value for the establishment of the athletes' physical function digital archive.

### **3. Main contents of functional digital archive**

The body function of digital archive is composed of the basic personal information and function assessment information.

#### **3.1 Basic personal information**

The basic function information includes demographics information and training information. Some basic information reflects the inherent characteristics of individuals, which are relatively stable and strongly objective throughout the whole life.

##### **3.1.1 Demographic information**

It includes the basic information, such as demographic and socio-economic as well as basic health information, such as the name, gender, date of birth, place of birth, nationality, origin, ethnicity.

##### **3.1.2 Training information**

It means a system of physical exercises or sport training information for example the training information of professional athletes includes specialized event, length of training, exercise performance, exercise level, sports teams etc; For an ordinary exercise people, you need to know his or her sports event, exercise period, exercise frequency, intensity of exercise etc.

##### **3.1.3 Archiving information**

The archiving information should include the archiving date, file management agencies, the units of functional test, the model of test instrument, and so on.

#### **3.2 Body-shaping information**

##### **3.2.1 Human morphology**

It includes the shape, fitness, and posture of the human body, usually judged by observation and measurement. It can be divided into height, length, circumference, width etc.

##### **3.2.2 Body composition**

Body composition is a key component of individual health and physical fitness, including fat and non-fat constituents. It is mainly constituted by fat, water, muscles (proteins) and bones (mineral).

##### **3.2.3 Body functional information**

Based on the characteristics of sports and research needs, the digital archive of fundamental data and common data elements can be created through cardiovascular function, immune system, endocrine system, oxygen transport system, muscle loading and function of tissue damage, aerobic and anaerobic metabolic function, balance function, sensory function, and so on, thus preparing the establishments of standard classification codes.

### **4. Body function's characteristics of digital archives**

#### **4.1 Dependence and unrecognized**

Electronic archives depend on computer software, hardware, database and network systems, which are different from the traditional archives on the carrier. Paper files are recorded by human readable record symbol, which can be directly read out; while electronic files using the magnetic media and optical media are recorded by the digital codes, they can be transformed human readable recordable only through computer decoding.

#### **4.2 High density of data accumulation and store**

Digital archive storage media takes advantage of the advanced electronic technology. Compared to paper files, its storage volume has been greatly improved. It can amass data and save them to facilitate long-term longitudinal study and research.

#### 4.3 Transmission of the shortcut

Based on the data cell format, digital archive can be used for synchronous transmission network. Compared with traditional transfer speeds, it makes a vast leap, for the data transmission is faster.

#### 4.4 Intelligent retrieval of information

With the rapid development of science and technology, network information technology in society has witnessed unprecedented development and widespread use. Digital Archives are easier to retrieval for coaches and researchers.

#### 4.5 Resource sharing of information

Archival institutions can undergo effective co-ordination and resources sharing activities under the principle of complementarity after valid and successful integration into an organized network within a certain scope. For the use of information resources, mutual constraint between users does not exist, namely, several users are capable of making effective use of the same information at the same time, without producing corresponding effects.

### 5. Methods to establish the body function of digital archives

The measurement and assessment of physical function relies on a variety of instruments and equipments which almost realize electronic computerization, thus providing conditions for test results recorded in a digital mode. For the vast range of collected original information of body function's digital archive, the original information can be sorting out by the means of classification, analysis and statistics, for the convenience of inquiry and use.

At the same time, when a single test in a single laboratory is developed into systematic and multiple tests in several laboratories, test centers, under the requirements of regulated tests, summarize the results of tests through network for the purpose of improving the quality of physical function's digital archives. This also provides powerful support and guarantee for the different applications.

#### 5.1 The uniformation of standards

As a necessary precondition for the construction of body function's digital archives, standards used to collect data must be in union. Only under the same regulated standard, the recorded data collected in different batches can

undergo classification, comparison, analysis and so on. Therefore, the uniformation of standards is a prerequisite for establishing digital archives.

#### 5.2 The uniformation of test methods

As tests for physical function, different test methods can be adopted because of different targets, different equipments, and different methodologies. Before establishing digital archives, comparative analysis in differences is necessary in order to choose regulated test methods or formula used for conversions between different test methods, then followed by the strict execution in the tests. Only in this way can the result be uniform, offering basis for further analysis and classification.

#### 5.3 The uniformation of recording method

It mainly includes the standardization of measurement units of test result.

In this way, single test result can have the value of summarization. In records, the interpretation should be in accordance with the unified standard in test results, and the use of recording units and formats is required for results storage and later use of these results.

#### 5.4 The uniformation of entry and upload format

Through the unified testing and recording and by conforming to the regulated requirements, the unified standards need to be applied to entry recording, such as using the Internet, as well as to upload format.

### 6. The management methods of physical function's digital archive.

The physical function's digital archive management mode must comply with the general digital archive management mode. It stored the information resources from different carriers and different geographic location in the form of digital and interconnected network. It can be provided to access and resource sharing. The digital archives of physical functions also need to scan the necessary testing process image to storage in order to analyze in addition to recording the paper records the results of previous tests, in accordance with the provisions of the standard requirements for the digital archive digital recording, This is particularly important for the evaluation of professional athletes.

## 6.1 Warrant

The principle of hierarchical authority using must be adopted in the management of physical functions digital archive due to digital files are easily modified. Different managers and users are given a different license, so that the stability and authenticity of digital files can be ensured to some extent. To ensure safe and reliable authenticity of the data, and to maximize the efficiency of the use of digital files, Authorized to modify, authorization to upload, authorized to download, and authorized to read multiple levels of authorization to proceed.

## 6.2 Security

To ensure the security of the digital archive, computer firewall technology and virus prevention must be strengthened; the invasion of the unauthorized users from login port will be prevented by identity authentication of login ; the security of digital files will be ensured by the encryption of corresponding data; some important information, such as a variety of operating systems and trying to online user's workstation IP address and time, can be automatically recorded by the trail, in order to study the invasion, to detect the early abnormal network access behavior as early as possible be eliminated in a timely manner; data should be backup immediately in fixed time to facilitate long-term data storage and recovery.

## 7. Conclusions

The establishment of the digital archive of physical functions, achieving the multi-channel dynamic, ensuring the players' body shape and function to the form of database technology resources for storage, exchange, management, protection and utilization, through the hierarchy of digital files, content, description, rules, classification code and directory format specification.

The digital archives make it easy to compile and use athletes' physique and function for sports teams and sports Research Institute. Through athletes' physical fitness involved in digital archives of data acquisition, analysis, collation, harmonization, aggregation, functional diagnostics provide quick feedback of data for athletes in different training stage. It is useful for guiding the athletes in training scheme or an injury rehabilitation programme and adjustment, making the exercise more scientific. Fitness population establishing the digital archives can make plans and reduce the risk campaign, effectively improving the

effect of training and promoting higher level of health. Building digital archives of body function is a long-term process of the ongoing accumulation, dynamic updates, co-constructing and sharing. The compilation of data is continuously improved with scientific development and actual needs.

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