

An Integration Hub of Exercise and Medical Care – Mobile Health Application's Service Construction and Regulations Navigation in "Health China"

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Abstract: Exercise mobile health application (mhAPP) is the integration hub of exercise and medical care, a new health management tool. It can facilitate the monitoring of some physiological health indicators of the human body during exercise/quiet state, collect information on exercise and diet behavior, and even medical history, and quickly generate a "health portrait" of a group or an individual, which is of great significance for China's big health services. Based on China's market service demand, data exchange theory, Internet information security law, APP industry decree and regulation, and borrowing from the U.S. APP information management system, this study constructs a theoretical model of China's big health service system with mhAPP as data source, government-regulated cloud platform as data manager, and hospitals, CDCs, shopping malls, restaurants and other organizations as third-party data users, and designed ordinances and regulations to support its operation.

Keywords: Mobile health Application, Integration hub of exercise and medical care, Big health, Service, Regulation

1. Introduction

Health is the foundation of people's happy life and the guarantee of productive work. In 2017, at the 19th Congress of the Communist Party of China, General Secretary Xi Jinping proposed the national strategy of "Health China", which is to "improve the national health policy and provide the people with a full range of health services", putting the people's health issues on an important and unprecedented position. This has put a whole new level of emphasis on the health of the people. However, China today is plagued by weak population growth, accelerated aging, uneven distribution of medical resources and coronavirus attacks, and still faces a lot of resistance and a long way to go to implement and promote the national strategy of "Healthy China".

Exercise is an effective non-pharmacological means of preventing and treating metabolic diseases/chronic illnesses. Since the founding of New China, the government has paid great attention to the value of exercise and health care, through the hosting of large-scale sports games, education and training in school sports, and the promotion of neighborhood councils, so that the people are fully aware of the benefits of exercise, and the slogan "develops / developed sports and strengthen people's physical fitness" is known to all people in China. In today's China, there are many people runnings, jumping rope, playing Taijiquan and dancing with / to parks and residential squares in the early morning and evening, which proves that the health care concept of "exercise as medical treatment" and "treating diseases before they occur" has been deeply rooted in people's hearts.

Known as the hub of exercise and medical care, exercise mobile health APP (mhAPP) is a new personal health management tool. Unlike medical mhAPPs, it does not have the function of online diagnosis by doctors, but can improve fitness efficiency and health by monitoring energy consumption and physiological indicators of exercise/quiet status, as well as exercise/diet planning and exercise courses. A related survey conducted by our research group earlier showed that mhAPP (meaning exercise mhAPP, same below) has a good mass base with a penetration rate of 33.9% in Chinese cities^[1] If the powerful information collection ability of mhAPP can be extended to the social public service field, it will be promising in the road of "Healthy China".

Based on the questionnaire survey of exercise mhAPP consumers, interviews with relevant experts,

and public information of related products on the Internet, and the existing APP and Internet service regulations, this study constructs a model of mhAPP's health services and designs supporting regulations. For the purpose of the research on the integration exercise and medical care, the following mhAPP refers to the exercise mhAPP.

2. Mhapp's Service and Data Architecture for Big Health

2.1. Mhapp-Big Health Platform Service Architecture and Application Analysis

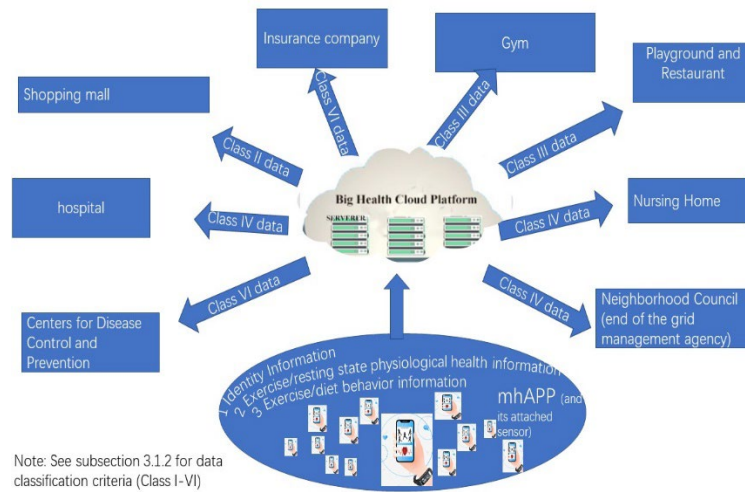


Figure 1: mhAPP's big health service architecture

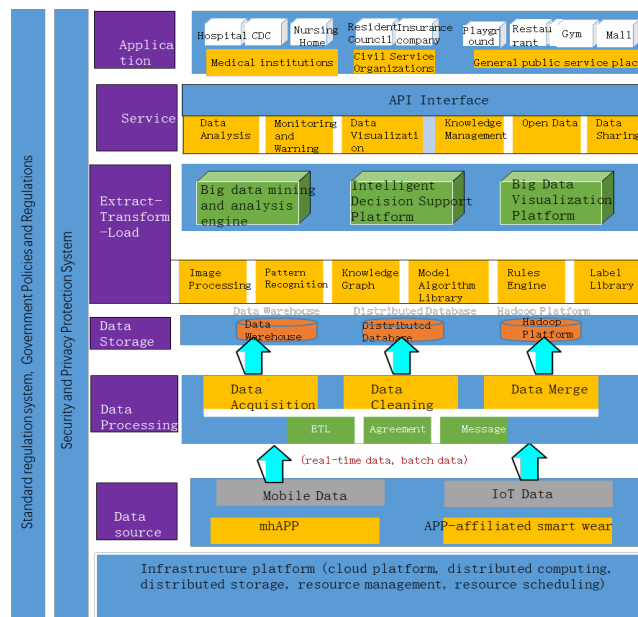


Figure 2: Data architecture of mhAPP in big health service

With the emergence of mhAPP, everyone becomes a manager of their own health information and a source of self-media-based health information. Self-health information management is easy to understand and easy to handle, specifically based on the APP (and its attached hardware sensors) to collect various basic physiological indicators (energy consumption, blood pressure, blood oxygen saturation, sleep quality, fall risk), to determine their own health level, and based on this to choose the appropriate exercise and nutrition plan, but even considering the simple health data sharing function of the circle of friends, this mhAPP and Only when personal information of mhAPP is fully integrated can its value be truly realized.

In this study, based on the theory of market supply and demand and the principle of big data, we designed the architecture model of mhAPP-platform-third party organization for big health service (see

fig1, fig2 below).

In terms of collection method, the data from mhAPP (and its attached hardware sensors) can be divided into two types: one type of data is obtained directly from APP and sensor measurements (energy consumption, blood pressure, ECG, exercise trajectory, etc.), and the other type of data is provided with user autonomy (fitness purpose, meal content, medical history, etc.). In terms of the nature of the data, it can be further divided into two categories: the first category is exercise/quiet health status data (including historical status) - energy consumption, heart rate, blood pressure, ECG, oxygen saturation, sleep quality, fall risk, weight, strength, aerobic capacity, and medical history, etc. The second part is health behavior data -- exercise purpose (e.g., waistline reduction, weight loss, muscle tone gain, etc.), mode of exercise choice (running, swimming, jumping rope, etc.), specific periods of exercise, exercise duration, exercise trajectory, travel speed, meal content/frequency, and nutrient content and energy of diet. These health status data and behavior data, which are closely related to health and highly time-sensitive, can clearly outline a "portrait" containing health needs, fitness behavior and health status, which are difficult to obtain through traditional means. One person's "portrait" may only be meaningful to him or her, but a "group portrait" will open new doors for Chinese "big health", just like the subversion of traditional media by "blossoming" self-media.

The work of "collection into fur" is done by the big data health cloud platform, where a large amount of personal mhAPP data is efficiently gathered, and after data screening, merging, cleaning, encryption, authority grading and visualization, it is docked to a third party, which forms the service model of "mhAPP (data source) - health cloud platform (data management and distribution) - third-party service providers (data users)" service model. In this study, the third parties are simply classified into medical institutions (hospitals, CDC, nursing homes), livelihood institutions (street offices, insurance companies) and general public service institutions (restaurants, playgrounds, gyms, large shopping malls), and the service architecture is designed to analyze their long-term vision.

Public hospitals and disease prevention and control centers are the authoritative executive departments of public health management, and they are inevitably the big demanders of mhAPP data. Traditional clinical access to long-term personal behavior and health status data is extremely difficult, but mhAPP (and its affiliated sensors) + cloud platform can make up for this shortcoming, data acquisition does not take up public resources of hospitals and CDC, and does not affect individual labor and life, data update timely. The mhAPP+ cloud platform system enables exercise/diet behavior data to be fully linked to exercise/quiet health status data (e.g., cardiovascular function, strength, endurance, sleep, balance), allowing "evidence-based medicine". For hospitals, this facilitates a leap forward in treatment practice and even medical theory. For the CDC, it can also use the data from mhAPP/Cloud platform to target the geographical areas, groups, and even individuals with health problems in time to achieve "early detection", "early prevention", and "early control".

Nursing homes will also get a lot of valuable information from the mhAPP+ health cloud platform. China's aging is in an accelerated stage, which has also promoted changes in the elderly care model, from the initial home care model where the most common middle-aged people support the elderly, to the current increasingly popular model of nursing home care for the even older elderly funded by the elderly. Nursing homes need to monitor the daily behavior of the elderly for a long time, and multiple monthly health checks, which consumes a lot of human and material resources, the home is hard, the elderly also feel uncomfortable, and with the help of mhAPP + cloud platform, nursing homes can greatly improve the above problems, the cloud platform timely updated behavioral and health information for the nursing home elderly monitoring and health warning to provide convenience. In addition, the guardians of the elderly can also apply to open access to the cloud platform data for the elderly at any time to keep abreast of the situation.

Insurance companies are not health management organizations, but have a high demand for personal health histories. When claims are actually made, insurance companies often refuse to pay for them on the grounds that they are "insured with a disease". This has led to a biased view of health insurance as "a fraudulent product that only pays and does not pay", and many people question "why do insurance companies accept insurance when you are sick?" The reason for this situation is not complicated, for cost reasons, insurance companies only check the past medical history of the insured when the insurance is issued, but do not investigate the health information when accepting the insurance. The only way to change this situation is to allow insurers to obtain health information about the insured at the time of acceptance without significantly increasing costs. MhAPP + Health Cloud Platform can provide strong support for this. In addition to physiological information, mhAPP + Health Cloud can also provide information on exercise behavior, dietary behavior, etc. This information is beneficial for insurance companies to better design flexible and diverse products to provide multi-level protection services for

different people.

The services of mhAPP + cloud platform are also extremely valuable for gym services. Gym service is a professional service place that provides training facilities, training movement guidance and training/diet planning for the purpose of improving body shape and enhancing body functions. It can be said that gyms and hospitals share the responsibility of social health management, but the difference is that hospitals deal with patients, while gyms tend to deal with people who have a higher standard of physical health. Gymnasiums are a sunrise industry in China, with a rapid growth in numbers over the last decade. Like medical services, fitness services also need a large amount of exercise behavior data and physiological health index data accumulation, and mhAPP + big health cloud platform can largely meet this demand. The larger the amount of relevant data, the more reasonable the fitness program/diet program setting, the scientific nature of fitness exercise will be more clearly positioned, and the deployment of hardware facilities in gyms will be more in line with customer needs. Therefore, although mhAPP is only a basic level of personal health management, mhAPP + big health cloud platform will certainly greatly promote the development of accurate services and fitness theory in gyms.

Restaurants, shopping malls, playgrounds and other commercial institutions can also make good use of mhAPP + cloud platform to achieve supply and demand matching and provide win-win accurate services. According to the data of diet content, sports content and sports route, it is easy to determine the demand for food and sports equipment of the group in specific regions, and the merchants (restaurants and shopping malls) can determine the quantity and category of food and sports clothing and equipment according to the demand accordingly. MhAPP+ cloud platform data can provide great support for this. mhAPP+ cloud platform information can also provide safety services for playgrounds. Large amusement park is a paradise of entertainment, widely loved by the public, but many entertainment projects are too exciting, but also some safety problems, the most common heart disease and hypertension patients fainting or even sudden death during the activities of certain projects. In some recreational projects with high physical load, the management can check the visitors' "sports health code" to screen their health status, in order to achieve the purpose of reducing business risks and protecting the safety of the public. This solution can also be applied to swimming pools, basketball stadiums, tennis courts, mass marathons, and even school games and other venues or occasions.

An important duty of the Town and Country Planning and Construction Bureau is to be responsible for land planning, and sound planning requires an in-depth understanding of the needs of residents. Planning and approval of highways, residential neighborhoods, schools, parks, playgrounds, shopping malls, office buildings, restaurant streets, hospitals, factories, etc. require a great deal of justification, and even then, there are still situations where there is a serious mismatch between supply and demand and forced rectification, such as schools being converted into office buildings, hospitals into factories, etc. The later rectification will involve a great deal of legal issues and economic losses, which is the last thing the planning department wants to see. The key to the misjudgment of supply and demand remains the difficulty of obtaining demand information. mhAPP + cloud platform of sports behavior information collection can solve this difficulty to some extent, from sports trajectory, exercise items, diet content can at least provide an important basis for the planning of parks, dining areas, hospitals, gyms, roads, which are closely related to sports health. The street office is the grassroots implementer of our government grid-based management system and has the responsibility to participate in the management of major public health and safety events. It is necessary for it to access the mhAPP+ cloud platform service in order to obtain information on the exercise behavior, diet behavior, and health indicators of groups in the relevant area in order to assist hospitals, nursing homes, disease control centers, and even police stations to better accomplish their health and safety management tasks.

2.2. Data Architecture of the Services of Mhapp-Big Health Platform

The health cloud platform adopts a hierarchical architecture, with the bottom layer being a cloud platform capable of dynamic storage and elastic computing. The data source is divided into two parts, one is the mhApp and the other is the IoT data connected by its peripheral sensors (such as watches and bracelets). These two parts of data are transferred in bulk or in real time through transfer tools under specified protocols. After further cleaning, it is integrated with other data from the health platform and brought together into a global unified data.

At the processing layer, data processing methods such as tag library, knowledge mapping, image processing, pattern recognition, model algorithms, and rule engines are used for the data warehouse, forming three major platforms: big data mining and analysis engine, intelligent decision support platform, and big data visualization platform. These platforms can provide data analysis, monitoring and early

warning, data visualization, data opening, data sharing and other services to the application layer.

3. Design and Planning of Mhapp's Big Health Service Regulation

The big health service of mhAPP cannot be escorted by the regulation of government decree. This involves the "Network Security Law of the People's Republic of China", "Data Security Law of the People's Republic of China", "Personal Information Security Law of the People's Republic of China", which have been implemented for many years, and several recommended regulations issued by the State Administration of Market Administration of China in recent years, including "Information Security Technology Basic Requirements for Personal Information Collection by Mobile Internet Applications (APP)" (GB/T 41391- 2022), "Information Technology Technical Requirements for Intelligent Mobile Terminal Application Software (APP)" (GB/T 37729-2019), and "Information Security Technology Mobile Medical Data Security Guidelines" (GB/T 39725-2020). According to the above regulations, this study plans and designs the regulations suitable for mhAPP, and because the United States is the most mature country for web services, the management model has strong significance, and some of its regulations are included in the discussion here.

3.1. Positioning of Mhapp and Its Regulation of Data Collection and Use for Big Health Services

3.1.1. Two positioning of mhAPP

Market positioning and legal positioning are important evaluation criteria for commodities. As an associate country of the Nice Agreement on the International Classification of Goods and Services for the Purposes of Registration of Marks, China now implements the trademark classification law "Table of Distinction of Similar Goods and Services" following the tenth edition of the Nice Agreement, which divides goods or services into 45 categories. All types of APP and its peripheral sensors belong to the 0901 class (electronic computer and its external equipment) of the large nine categories of electronic computer class, so the market mhAPP and its peripherals are in this list, that is, electronic computer class software and hardware products. As for market positioning, the main selling point of mhAPP marketing is sports health management products, and core functions such as fitness planning, nutrition planning, and fitness course selection all rely heavily on sports indicator measurement analysis. In China's market, only a few new smartwatches and their mhAPP systems have passed the CFDA Class II medical device registration certification by the end of 2021. The reality of low data accuracy (unable to pass medical device certification) in most products and the market positioning of health management actually reflects the misalignment between the legal and market positioning of mhAPP in China.

As a data source to connect to big health services, it is clear that only medical-grade mhAPP (and its attached sensors) are candidates, which is the most basic requirement to ensure the reliability of information.

3.1.2. Discussion and Design of the Regulations of Mhapp in Big Health Services

Improper collection and use of APP personal information is not a new problem, and several serious security incidents have erupted worldwide in recent years - on January 6, 2018, the Network Security Coordination Bureau of the State Internet Information Office pointed out that the way Alipay and Sesame Credit collect and use personal information is not in line with the Information Security Technology Personal Information Security. On March 17, 2018, the New York Times reported that more than 50 million users' information data on Facebook had been leaked by a company called Cambridge Analytica, and the U.S. Federal Trade Commission also launched an investigation. In this context, in order to protect the rights and interests of personal information and regulate the personal information collection behavior of APP, China has successively issued the Notice on the Issuance of <APP Illegal Personal Information Collection Practice Determination Method> (State Information Office Secret Word [2019] No. 191), the Notice on the Issuance of (Provisions on the Scope of Necessary Personal Information for Common Types of Mobile Internet Applications) (State Information Version Secret Word [2021] No. 14) and other documents. The latest regulatory document in this regard is the non-mandatory/recommended Requirements (GB/T 41391-2022) introduced by the State Administration of Market Supervision and Administration of China in 2022 ^[2], according to which this study analyzes and discusses in the context of the actual situation of mhAPP health services.

The minimum necessity provisions in the requirements ^[2] include: (1) "the personal information collected shall be limited to the minimum extent necessary for the purpose of processing"; (2) "the personal information collected shall have a clear, reasonable and specific purpose of processing"; (3) "the

personal information shall be collected in a manner that minimizes the impact on the rights and interests of the individual"; (4) "the personal information collected shall be directly related to the purpose of processing"; and (5) "the personal information shall be collected only when the user collected when using a business function and is personal information required for that business." Both (2) and (4) refer to the principle of legality, i.e., the information collected shall be used directly for the purpose and the purpose itself shall be clear and reasonable. (5) refers to the principle of temporality, which should only be collected in the course of using the application. Avoid continuous collection of information without the knowledge of the user. (1) and (3) refer to the principle of convergence, i.e., it is better to collect less data than more, especially sensitive data, and the principle is not to collect as much as possible to avoid expansive collection of large amounts of irrelevant data for other non-legitimate purposes. From the scenario of mhAPP's participation in big health cloud services, the legality and timeliness of data collection need to be observed, but in terms of articulation, the current regulation still needs to be improved. On May 1, 2021, the Regulations on the Scope of Essential Personal Information of Common Types of Mobile Internet Applications jointly formulated by the State Internet Information Office of China, the Ministry of Industry and Information Technology, the Ministry of Public Security, and the State Administration of Market Supervision and Administration began to be officially implemented. The regulations clarify the scope of necessary personal information collection for 39 common types of APPs. For exercise/sport APPs, personal information is not required to use basic functional services. This requirement is perfectly feasible for mhAPPs that do not participate in big health services. For pure personal health management or entertainment, private information is only stored on the mobile side of mhAPPs, and data is not collected and does not affect normal use, but the situation is different for mhAPPs that participate in big health services, and there is a balance between convenience and security. The health cloud platform needs access to more detailed "profiles" to provide better services, and accordingly, users need to take higher but limited security risks, just like the health code service (collecting private information such as vaccination status and travel trajectory) launched in China to fight the epidemic (coronavirus outbreak). In addition to the physiological health information collected by mhAPPs (and their sensors), identity information and medical history also need to be provided by the customer on an informed basis.

The notification consent regulations of the Requirements ^[2] include (1) "users shall be informed of the core content of the personal information protection policy in a prominent manner, prompted to read the personal information protection policy and obtain their express consent", (2) "users shall be informed of the basic business functions, extended business functions and the scope of necessary personal information of the APP, and shall distinguish significantly between necessary and non-necessary personal information", (3) "consent for necessary personal information and non-necessary personal information of the APP shall be separated", (4) "when users agree that the necessary personal information of the APP is and the scope of necessary personal information, and distinguish significantly between necessary and non-necessary personal information", (3) "should split the consent of APP's necessary personal information and non-necessary personal information", (4) "when the user agrees to the necessary personal information of the cell phone APP, it should be guaranteed that users can refuse or withdraw consent to mobile phone non-essential personal information, and users should not be denied access to the basic business functions of the APP because they refuse or withdraw consent to provide non-essential personal information", (5) "extended business functions should be opened by users' own choice, and if users refuse, close or withdraw from extended business functions, it should not affect (6) "Users shall not be induced or forced to agree to personal information collection requests at one time by bundling different types of services, bundling basic business functions and extended business functions, or applying for authorization in bulk", (7) "Personal information shall be collected because of laws and regulations. (8) "The user shall be provided with a query method for the type of personal information that has been collected and shall be displayed through a separate interface of the APP, etc.". (9) Consent to inform sensitive information - If biometric, religious belief, specific identity, medical and health, financial account, or whereabouts track is collected, the user should be informed of the purpose of collection and use at the same time, and the purpose should be described in a specific and understandable way, and the user's individual consent should be obtained. (10) sensitive information to inform consent - the collection of information on minors under 14 years of age, should be specifically formulated personal information processing rules, including the name or sex name and contact information of the APP operator, the purpose and manner of processing personal information of minors, the type of personal information of minors processed, the retention period, the manner and procedures of the user form personal information rights, the necessity of processing personal information of minors, the impact on the personal rights of minors. The impact on the personal rights and interests of minors. (11) Notification of Consent for Sensitive Information - The collection of personal information of minors under 14 years of age shall be

subject to the separate consent of their guardians. In the analysis of the above regulations, the regulations in (1) - (11) are all applicable to mhAPP health services, but can be combined and simplified. (1) is the prominence and optionality of informing consent, (2) (9) and (3) (6) are the differentiation of information collection and independence of informing consent, respectively. (4) (5) Must be personal information collection and extension of business functions of the deniability or revocable consent. (7) It is the clarity of the regulations. Part of the data collection for regulatory requirements, the user should have the right to clearly understand the specific regulations (8) is the accessibility of self-collected information. The function of "allowing users to visually display the data they have collected" should be useful for mhAPP's big health service, as in the above service architecture, where visitors can present their exercise health code on the spot for inspection by the amusement park management when participating in high stimulation projects (jumpers, roller coasters, etc.). (10) (11) It is the special interest exclusivity of informing consent and guardian constraint of data collection for minors under 14 years old. This group is mentally immature and legally requires guardian consent for any major decisions and enjoys a legally higher level of protection than adults, and accordingly, APPs have a legal obligation to inform their rights and interests in a more explicit manner for their data collection.

APP access to third parties that can collect personal information, the third party hand collection information should be safely managed (requirements^[2]), including (1) should be clear with the third party both personal information processing rules and protection responsibilities, including a the purpose, manner and scope of third-party collection of personal information, b the third party application system permissions and application purposes, c personal information provided to the third party The type of personal information provided to the third party, the retention period, the way of handling personal information after stopping the intervention, d the responsibility of both parties for the security and protection of personal information, e the measures of the third party application to assist the APP corresponding to the user's personal information rights request. (2) shall provide the user with a channel for authorization management of the third-party application to ensure that the user conveniently closes or withdraws authorization for the third-party application to collect personal information permissions, and authorization to provide personal information to the third-party application, except for the third-party application to provide the basic business functions of the APP. (3) Users should be reminded of the personal information handling rules of third-party apps, and should not privately intercept personal information that users have only agreed to provide to third-party apps without their consent. Analyzing the above, we consider mhAPP + health cloud platform as a data source as a whole, i.e. mhAPP/cloud platform, and data using organizations (such as hospitals, CDC, restaurants, etc.) as third parties. On the basis of what regulation can mhAPP/cloud platform safely share personal information to third parties? (1) It is the clarity of third party data use rules, protection responsibilities and measures. (2) The revocability of individual authorization (for third parties). (3) It is the data non-interceptability (mhAPP/platform side shall not intercept the data that the user intends to supply to the third party only). This law study believes that data sharing and use involves parties to clarify the rules and responsibilities of each party, and the user's right to revoke authorization is a necessity, (1) (3) applies to mhAPP/cloud platform and third-party data docking services, but (2) does not apply, because the government-regulated big health platform in the supply of information its leading role in the supply chain, the direct upstream of the third party, the cloud platform to have complete data, not Involves the issue of data interception.

According to the classification suggestions of the Guide^[3], and considering the fact of mhAPP, we suggest set data into four categories: Class I, information that can be fully disclosed and does not require authorization. This refers to information that is not personally identifiable and is of low sensitivity. For example, group diet and exercise habits. This type of information is freely available to all institutions and individuals. This refers to non-personally identifiable information about group behavior and health profiles that is suitable for use by authorized organizations to understand supply and demand, such as shopping malls and restaurants. This refers to group behavioral and health profile information with partial identification (e.g., gender, age group, occupation) that must be authorized, such as information provided to urban and rural construction and planning bureaus and neighborhood councils. category IV, data that is accessible on a smaller scale in total and may cause a higher degree of harm to individual subjects if disclosed without authorization, such as moderately sensitive data with direct identifiers, such as information provided to hospitals, insurance companies. Class VI, sensitive data that is only accessible on a small scale and under strictly limited conditions. For example, information provided to the CDC and the Public Security Bureau.

3.2. Key Points of the US Mhapp Regulations

As the most developed country in the information industry, mhAPP has perfect regulations in the

United States. Understanding these regulations has implications for the construction of governmental regulations in China.

In the U.S., mhAPP is governed by two regulations: the Health Insurance Portability and Accountability Act (HIPAA) issued by the U.S. Congress in 1996 and the Mobile Health Application Guidelines (MHA) issued by the U.S. Food and Drug Administration in 2013. The Health Insurance Portability and Accountability Act (HIPAA) is a personal privacy protection regulation whose main purpose is to limit the improper use of personal privacy information by hospitals and insurance companies, including an informed consent system, a management simplification system, a patient medical record access system, and a minimal disclosure system, which requires healthcare organizations' information technology and management processes to have security measures to protect patients' privacy, as well as the obligation to maintain it. The 2013 amendments to the Act provide for the application of mobile technology to all types of APPs and applications and health. It also specifies penalties for violations of personal privacy, including imprisonment for 1-10 years and fines of \$50-1.5 million.

The Final Guidance clarifies the scope and methods of oversight and sets forth principles for determining liability. Three levels of supervision are possible depending on the harm caused to the patient by the mhAPP, with Level I medical devices with minimal health risks and FDA discretion in sentencing, Level II devices that may cause minor and moderate injury, and Level III causing serious injury or death. The Guidance considers three points in determining liability, operational, associational, and public.

4. Conclusions

Exercise mhAPP is a new type of health management tool that can collect basic but important physiological health indicators such as exercise/quiet state energy consumption, blood pressure, ECG, oxygen saturation, sleep index, balance ability, and user's exercise/diet behavior, medical history, identity information, etc. mhAPP not only provides great convenience for personal health management, but also opens a door for China's big health service, through the cloud platform, the health information, behavior information and identity information of mhAPP users can be integrated to form a clear "user profile", allowing third-party service providers to fully grasp user needs and provide accurate health services. Based on Chinese market demand, network security law, data security law, APP information use regulation (also borrowed some information protection regulation in the United States) and data exchange theory, this study constructs a service framework, data model and supporting laws and regulations of mhAPP - big health cloud platform - third-party organizations, and aims to provide a theoretical basis for Chinese style big health cluster services.

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