Data analysis software for medical wearables

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Abstract. The medical wearable device data analysis software of this product analyzes the measurement data through the data connection with various types of medical wearable devices, compares the standard values of various data of each age group, and a number of data that do not meet the standard values or a certain item that does not meet their daily average value for many days will be identified as an abnormal situation, and the user will be reminded to do a personalized physical examination, and the software will recommend a suitable time for the user to conduct a personalized physical examination according to the user's location. And through the introduction of blockchain technology, the safe storage and sharing of medical wearable device data is realized while protecting user privacy. In addition, the medical wearable device data analysis software is built into a social health management platform, where users can share and exchange health data, experiences and recommendations. By socializing the app, you can increase user engagement and loyalty, and attract more users to use the app.

Keywords: market analysis, product design, medical wearable device data analysis software

1. Introduction

With the continuous development of science and technology, medical wearable devices have become one of the important technologies in the field of medical and health care, and medical wearable data analysis software has also come into being. However, the statistical analysis rules of the existing medical wearable data analysis software are often single and fixed, and cannot scientifically predict and warn according to the user's health status and risk assessment, and provide personalized physical examination suggestions and corresponding diagnosis and treatment suggestions. In addition, wearable technology can collect and transmit large amounts of personal data, which are often shared with third parties, making them vulnerable to hacking and data breaches, which can put users' personal information at risk. To sum up, there is an urgent need for a solution that can analyze health data and provide personalized physical examination solutions, so as to realize the safe storage and sharing of medical wearable device data, protect user privacy, and provide users with more comprehensive and accurate health data analysis software.

2. Market analysis

This chapter conducts market analysis and market research for medical wearable device data analysis software, and we will conduct a comprehensive analysis of the medical wearable device data analysis software market and competitors from the following aspects.

2.1. Industry background and market analysis

With the continuous development of science and technology, medical wearable devices have become one of the important technologies in the field of medical and health care, which can realize real-time monitoring and data collection of human physiological indicators through sensors, intelligent algorithms and other technical means. These data are rich and diverse, which can provide more comprehensive and accurate medical services for medical institutions, doctors and patients. According to statistics, the size of China's wearable medical equipment market has grown from 1.2 billion yuan in 2015 to 12.2 billion yuan in 2020, showing a strong growth trend, and the value will exceed 20 billion yuan by 2023. From 2015 to 2023, the market size of China's wearable medical devices will grow rapidly. The rise of medical wearables marks a digital revolution in the healthcare industry. These devices are not only capable of monitoring the health of patients, but also collecting large amounts of health data. However, the value of this data can only be realized if it is analyzed and interpreted. Medical wearable device data analysis software came into being, providing a new direction for the medical industry.

(1) Market overview

The medical wearable device data analysis software market is an emerging market with great potential. As people's attention to health continues to increase, the sales of medical wearables are also growing. The vast amount of data generated by these devices has become a valuable resource for the medical industry. The emergence of data analysis software has filled the gap in data processing and analysis in the medical industry, providing medical institutions with more comprehensive and accurate health data.

(2) Market development trends

With the popularization of medical wearable devices and the continuous advancement of data analysis technology, the medical wearable device data analysis software market has shown the following development trends:

(2.1) Improvement of data security

The data generated by medical wearable devices contains the patient's personal health information, so the security of the data is a very important issue. Data that is not adequately protected can be exploited by criminals, leading to the compromise of patient privacy. Therefore, measures to strengthen data security are indispensable in the development process of data analysis software.

(2.2) Application of artificial intelligence technology

The rapid development of artificial intelligence technology has brought new opportunities to the medical wearable device data analysis software market. By combining artificial intelligence technology with data analysis software, more accurate data analysis and prediction can be achieved, providing more accurate diagnosis and treatment options for medical institutions.

(2.3) Popularization of medical and health management

With the increasing importance of health management, the demand for medical and health management is also increasing. Medical wearable device data analysis software can help patients better manage their health status and provide personalized health advice and guidance. This brings a broader development space for the medical wearable device data analysis software market.

(3) Market opportunities

The development of the medical wearable device data analysis software market has brought huge business opportunities to the medical industry. Here are some of the potential business opportunities:

(3.1) Opportunities for cooperation with medical institutions

Healthcare organizations can work with data analytics software developers to co-develop data analytics software for medical wearables. By working together, healthcare providers can improve patient outcomes and provide more comprehensive, personalized care.

(3.2) Opportunities for cooperation with health insurance companies

Health insurers can use the results of medical wearable device data analysis software to assess patients' health status and provide patients with more accurate insurance plans. By partnering with data analytics software developers, health insurers can improve the accuracy and efficiency of their insurance operations.

(3.3) Opportunities to provide health management services

Data analytics software developers can provide health management services directly to patients to help them better manage their health status. By providing personalized health advice and guidance, data analytics software developers can provide patients with more comprehensive and professional health management services.

The medical wearables data analytics software market is an emerging market full of business opportunities. With the popularity of medical wearables and the continuous development of data analysis technology, the market will usher in more development opportunities. Medical institutions, health insurance companies, and data analysis software developers can work together to promote the development of the medical wearable device data analysis software market and provide patients with better medical and health management services through win-win cooperation.

2.2. Analysis of similar competitive products

Medical wearables are the bellwether of modern medicine, as they are able to monitor the physical health of patients and collect data from patients of all ages. If the data is not analyzed, it has no value. Many companies have also noticed this, and here are some of the mainstream medical wearable device data analysis software on the market, and we will use SWOT analysis to analyze some of the advantages and disadvantages of these software, as well as opportunities and threats.

Table 1. SWOT analysis of five types of branded software

Pharmaceutical wearables Data analysis software	BGI	Brief data	apple health	Fibit	Garmin
Market share	20%	16.4%	34.1%	2.8%	6.8%
country	China	China	United States	United States	United States
Function	Genetic monitoring and merchandising services are provided to pregnant women during pregnancy.	Committed to huge data analysis, covering a wide range of aspects, including finance, automotive, health, food and beverage, etc.	The Apple Health app highlights four categories: Activity, Sleep, Mindfulness, and Nutrition.	The software that exists in the smart watch can record the movement data at all times, and it is relatively accurate. Your target heart rate zones are calculated based on your age and your resting heart rate, and Fitbit Charge 4 automatically	It has a very complete sports recording system, in addition to daily running, cycling, etc., as well as diving, swimming, golf, archery, etc., and can customize a suitable training plan according to your goals and physical strength, and

Table 1. (continued)

				recalculates those zones as your overall fitness improves.	automatically generate a report when recording monitoring data.
Advantage	1. The leading industry of gene sequencing in China, with accurate gene sequencing. 2.There is special genetic monitoring and commodity purchase for pregnant women.	1. It covers a wide range, and people's most basic clothing, food, housing and transportation can be used for analysis. 2. The data analysis is accurate and the database is huge.	1. It has the world's largest market share of medical wearable devices and a large user base. 2.The high defensiveness and smoothness of the Apple system.	1. The data calculation is very accurate and will provide real-time monitoring. 2.Each age group is calculated, and the data is transformed as the age group changes.	1. The motion monitoring function is very comprehensive, including almost all human movements. 2. It can automatically generate reports and can be stored for a long time.
Inferior Position	1. Basically, it is only for patients, not for the general public. 2.In addition to genetic monitoring, other functions need to be strengthened.	1. Less analysis in terms of medical data analysis. 2. The primary source is second-party and third-party data, which may be inaccurate. 3.Data contains personal privacy, and insufficient data protection may lead to information leakage.	1. The data source is mainly from the manual input of Apple users, and the data is inaccurate and subjective. 2. Users are limited to using only Apple mobile phones. Limits the user base.	1. Fibit's data collection is mainly limited to the bracelet, and users who do not have a bracelet cannot collect data. 2.The high price of Fibit bracelets restricts the development of its manufacturers.	1. Extremely dependent on GPS positioning, if there is no signal data, it cannot be accurately collected. 2.The price of Gramin is relatively high and the cost is larger.
Opportunity	1. The growth of the biotechnology market and	1. With advanced data analysis technology,	1. Apple's iOS system has a good ecology, and	1.Fibit can be integrated with other brands to	1. Gramin has a strong analysis tool, which can

Table 1. (continued)

	the data analytics market provides more opportunities for BGI. 2.With the continuous development of technology, BGI can increase its market share by expanding its business.	we can continue to develop and innovate. 2.The big data analysis market has broad prospects, and it can use its own technical advantages to develop a broader market.	Apple has a huge user base. 2. Apple's technology is advanced, and the security performance of the system is good.	collect data. 2.People's continuous attention to health has provided a huge market for data analysis software for medical wearable devices.	enter other markets and increase its market share.
Threat	1. In terms of biological genes, the market has more advanced technology than BGI, and BGI also needs to improve its strength to stabilize its market position.	1. As more and more competitors emerge in the market, the competitive pressure increases. 2. With the continuous development of technology, it is necessary to learn new technologies to maintain its position.	1. Apple Health relies heavily on Apple devices, restricting its user base, and its market share may be affected if users move to other brands.	1. With the emergence of more and more data analysis software in the market, there is greater competitive pressure. 2.Fibit's main user is the bracelet, and users who do not use the bracelet or switch to other brands will cause a decline in market share.	1. The rise of smart watches may have a certain impact on sports watches and their software. 2. Rely heavily on GPS, so that those sports bracelets that do not rely on satellite positioning can seize market share.

SWOT is used to analyze similar competitors, and the market share is added on top of this (Figure 1)
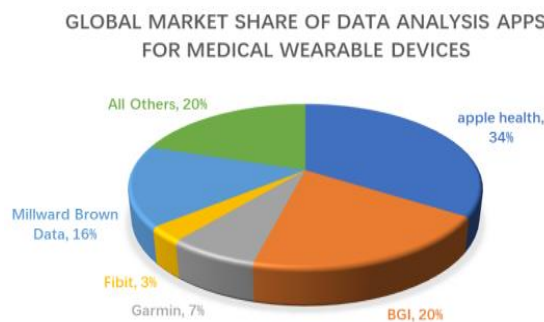

Figure 1. Global market share of data analysis apps for medical wearable devices

As shown in Figure 1, the global medical wearable data analysis software market sector chart is illustrated. Among them, apple health has the largest market share of 34%, BGI has 20%, Mingluo data has 16%, Gramin 7%, and Fibit has 3%. Apple Health functions in every aspect of the lives of ordinary people. And it has Apple's huge user base, resulting in its highest market share.

Combined with Table 1 and Figure 1, it is summarized:

(1). As can be seen from the table, most wearable device data analysis software has sports data analysis, integrated data analysis and other systems, which are common characteristics of health data analysis software and are the most basic functions. Our brand's wearable device data analysis software also has corresponding basic functions.

(2). From the point of view of the characteristics of the products, some brands have overlapping functions, such as Apple, Fibit and Gramin can accurately analyze the movement situation. However, most brands of health data analysis software have their own characteristics, such as BGI can perform genetic testing and pregnancy product purchases, Fibit and Apple can accurately heart rate, etc., and Gramin can form special reports. Our brand's wearable health device data analysis software monitors the user's physical health by uploading the data and comparing the normal data of each age group at the same time as the measurement data. If there is a difference between the average for multiple days or the average of multiple data and the average of the user's age group, the user will be reminded to do a personalized health check-up, and you will be recommended to a nearby hospital or physical examination center to escort your physical safety.

(3). From the point of view of the shortcomings of supplies, the functions of most wearable health device data analysis software are very miscellaneous and extremely unstable, and medical equipment data processing is rarely used in data processing. At the same time, the data transmission is unstable, and the data contains the personal privacy of most people, which cannot be absolutely secure, which is a common problem of data analysis software. Our medical wearable data analysis software transmits data through Bluetooth and NFC connections, which can achieve secure transmission and reduce the probability of data omission. At the same time, we focus on medical wearable data analysis, and strive to reduce medical costs and prevent early detection and treatment of diseases through these data.

(4). From the perspective of opportunities, Apple has the world's largest user base and bracelet holdings, occupying a large part of the market, Fibit wearable health devices have a beautiful appearance, very popular with young consumers, because the software and bracelet binding, so most of the data come from young people. Gramin's main sports wearable health equipment can help people exercise better healthily. Our brand's wearable health device data analysis software focuses on health monitoring and physical examination, and the target market can be set as young and middle-aged and elderly people, people who need data monitoring and recovery after illness, and people can choose our products for data analysis according to the different bracelets they wear.

(5). From the point of view of threats, most of the health data analysis software because of technical limitations, can not achieve the integrity and accuracy of the indicators, at the same time, the international market has been monopolized by Apple and other brands for a long time, the huge user group and users of the high standard of health data analysis software can not be reached, the high price of mobile phones, low configuration, can not adapt with health data analysis software, etc., are the threat of health data analysis software. Major manufacturers always want to make health data analysis software fully functional, but due to technical limitations, it is difficult to make products that satisfy customers. The main function of our brand's health data analysis software is to upload the data accurately measured by various medical wearable devices to the database for data comparison and analysis, so as to facilitate the appointment of personalized physical examinations, and the daily monitoring data can also be used in medical aspects.

2.3. 4P Strategy Analysis

2.3.1. Product Strategy

1. The layout of the plate is reasonable, attracting the main users: the health data analysis software has an interface layout and functional modules that are easy for users of all ages to understand and use, in order to serve people of different ages, the health data analysis software also adds a concise mode and an elderly mode, so that users and doctors can use the application more easily to better monitor the user's physical condition in real time, find physical abnormalities in time, and analyze and deal with them.

2. Improve analysis efficiency and increase innovative functions: Using modern artificial intelligence technology and existing databases, more intelligent algorithms are added to the software, and the assessment and analysis of physical conditions of big data can be realized more quickly, accurately and efficiently, so as to improve the speed and accuracy of diagnosis. The health data analysis software also adds a new appointment for physical examination function, which can remind and help users make an appointment for physical examination in a hospital close to the user when the data is abnormal, avoiding the long-term vacuum period of people's semi-annual physical examination, and also avoiding the inability to determine the specific physical examination items due to lack of data.

3. Security: To ensure the privacy and data security of patients, the password key with extended standard is adopted in the process of data transmission, and the regional management is carried out according to the administrative division of the region, and the itinerary information is closed, so that the data transmission and storage are more secure.

2.3.2. Price

1. Direct cross-subsidy: Most of the products in the health data analysis software are free and open to users. Using the psychology of free first users in price marketing can retain a large number of users and attract users to buy other products. There is a special VIP area in the software, and users can decide whether to recharge VIP to continue using VIP functions after a short-term trial of some functions.

2. Gift economic model: Health data analysis software will improve brand awareness and reputation through a series of gifts, premiums and other ways, rather than a single profit. For example, newly registered users in the software can get 30 days of free VIP benefits, during which users can experience all the services of VIP users. In addition to this, it is also possible to set up sweepstakes or discount offers, etc., among other features.

3. Labor exchange: In the labor exchange model, users can participate in the process of creating products while consuming products. In the health data analysis software, users can comment on and create content such as health information or popular science articles, and can also communicate with doctors in the connection function. In this process, the user's review also becomes part of the product, creating the product while using and consuming the product. This model can attract more users to participate and enhance user stickiness [1].

2.3.3. Promotional Strategy

1. Target users: medical staff, patients (using medical wearable devices), young people and middle-aged and elderly people (accustomed to wearing wearable devices).

2. Sales channels: mobile phone application stores, cooperation with medical institutions, cooperation and promotion of medical wearable devices, free download of software and membership system.

3. Marketing activities: open your own social accounts such as Douyin, Kuaishou, Weibo, etc., to promote products.

Post information on social media, invite medical staff, patients, etc. to try the product, and receive feedback from users to correct it in a timely manner. At the press conference, a number of lucky viewers will be randomly selected and fully functional services will be launched within two years.

4. Establish partnerships: In the product development stage, we can cooperate with medical device manufacturers and companies to jointly promote products to enhance product influence.

5. Provide personalized services: Provide personalized physical examination solutions through the analysis of patient physiological data.

6. Optimize user experience: set up a simple and beautiful interface, set up a voice navigation assistant for middle-aged and elderly people, provide real-time data analysis results, and carry out data visualization display, and protect data security through Bluetooth and NFC data transmission to improve customer loyalty.

2.3.4. Channel Strategy

1. Online store: The medical wearable device data analysis software will be put on the shelves of major online stores, such as the Software Store, Google Play, and HUAWEI AppGallery, so that users can easily download and use it.

2. Medical institutions: Work with medical institutions to promote medical wearable device data analysis software to doctors and nurses, so that they can more easily manage and analyze patients' health data.

3. Medical equipment distributors: Cooperate with medical equipment distributors to provide medical wearable device data analysis software to customers as an additional service to increase the added value of products.

4. Social media: Promote medical wearable device data analysis software to potential users by posting information on social media and sharing successful cases, so as to increase users' attention and interest.

5. Exhibition: Participate in the exhibition of medical equipment and technology, show the advantages and characteristics of medical wearable device data analysis software, and attract the attention and interest of potential users.

6. Email Marketing: Introduce the features and benefits of medical wearable device data analysis software by sending emails to potential users to increase user awareness and interest.

7. Word-of-mouth marketing: Through user word-of-mouth, let more users know about medical wearable devices.

8. Advertising and marketing: Open your own short video account, regularly explain the way to use the software live, and shoot interesting videos to increase users' goodwill towards the software.

3. Product design

In order to better understand the operation mode, main functions and page views of medical wearable device data analysis software, this chapter provides a comprehensive introduction to the design of medical wearable device data analysis software.

3.1. User Registration and Information Filling

When using the software for the first time, the user needs to register and fill in the basic personal information (such as name, gender, age, height, weight, etc.), as well as health history, disease history, drug use history and other information, which will be stored in the software as a personal health record.

3.2. Device Connectivity and Data Collection

Users can collect personal physiological index data, including heart rate, blood pressure, blood sugar, sleep, exercise, and other data, by connecting medical wearable devices (such as smart bracelets, smart watches, smart blood pressure monitors, etc.). The software automatically synchronizes and stores this data, as well as analyzes and processes it. The connection mode adopts NFC and Bluetooth hybrid connection data transmission mode, and the data is migrated from the medical wearable device through the coordination of the mobile phone software through the background service layer, so that the data can be automatically imported for data analysis. As shown in Figure 1, the NFC and Bluetooth hybrid connection mode can ensure the security of user data and the stability of data transmission (as shown in Figure 2).

3.3. Personalized medical examination recommendations

Based on the user's personal health record and physiological index data, the software can provide personalized physical examination suggestions according to the user's health status and risk assessment. For example, for patients with high blood pressure, the software can suggest regular blood pressure measurements and adjust the dosage of medications, and for users who are sleep deprived, the software can suggest improving the sleep environment and work and rest habits.

3.4. Health data analysis and trend forecasting

The software can analyze and process the user's health data, generate health data reports, and predict future physiological indicator trends. For example, for patients with cardiovascular disease, the software can predict future trends in heart rate and blood pressure and provide corresponding intervention recommendations.

Doctor consultation and appointment: Users can consult and make appointments with doctors through the software, and doctors can view the user's health data and health files through the software, and provide corresponding diagnosis and treatment recommendations.

3.5. Data Exception Reminder

After data analysis and comparison, the reference range of individual data is established according to the set standard values for different age groups (based on the basic data and historical data of the individual) for comparison with the standard values. The reference range is usually a range, including the minimum, maximum and intermediate values, etc., in order to judge whether the individual data is normal), a number of data do not meet the standard value or one or several data do not meet the standard value, the software will remind people to carry out a personalized physical examination, and then form a personalized report while recommending a nearby hospital outpatient clinic and a suitable time for physical examination.
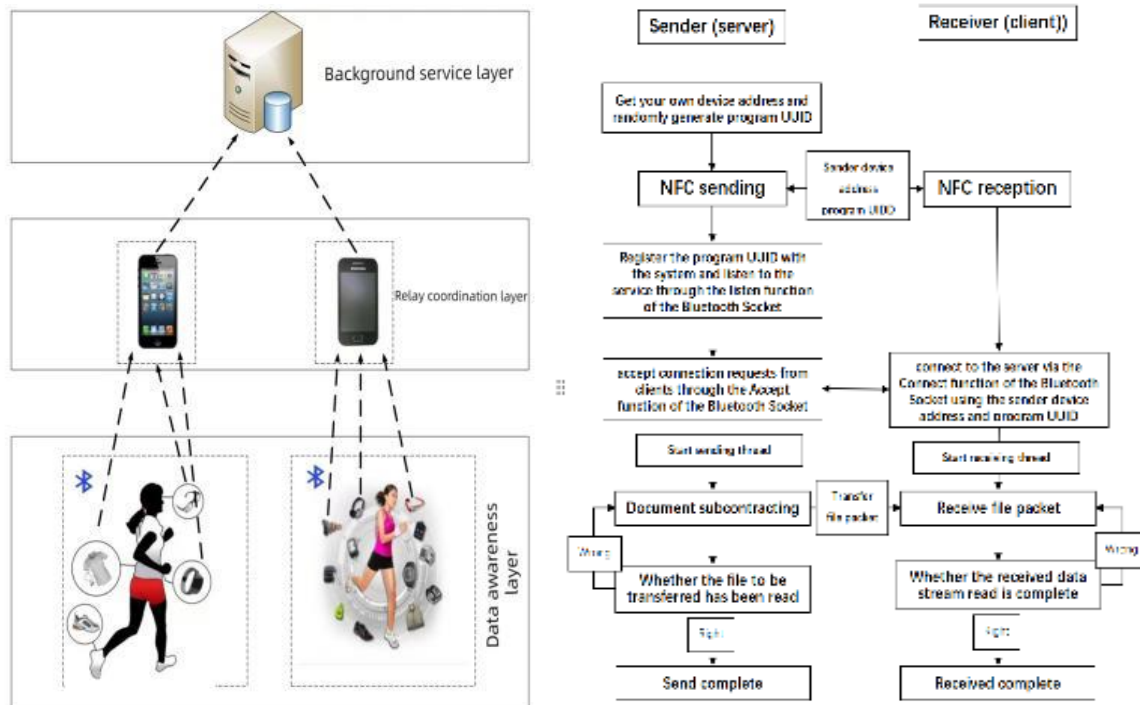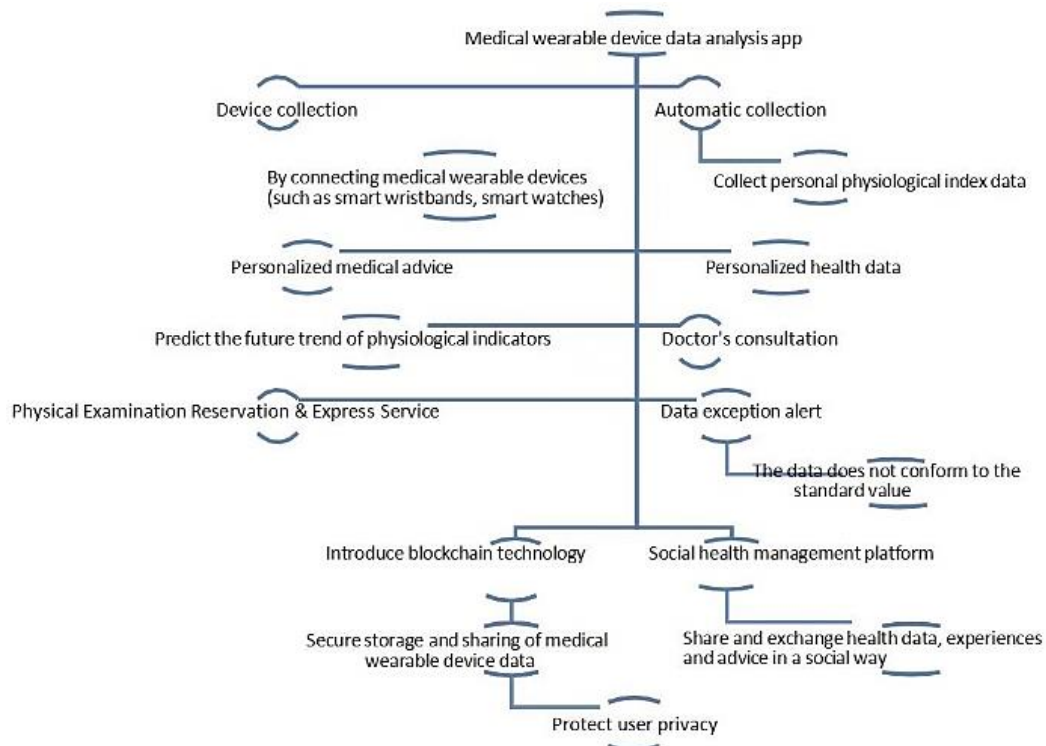

Figure 2. Product operation flow chart

Figure 3. Product design

3.6. Data support

Mobile app development: Use mainstream mobile app development platforms and technologies, such as Swift or Objective-C for iOS development, and Java or Kotlin for Android development.

Data Acquisition, Storage, Analysis: Collect device sensor data by interacting with medical wearable devices, and transmit the data to mobile devices using Bluetooth, Wi-Fi, or other communication technologies. Use data such as SQLite or Realm to store and manage the collected data, so that subsequent data analysis and processing can use data analysis algorithms and technologies to process and analyze the collected data and extract useful information and indicators. Techniques such as machine learning and artificial intelligence can be used for data mining and pattern recognition.

Visualization and interface design: Design an intuitive and user-friendly user interface, and display the analysis results to users in the form of charts, graphs, etc., to help users understand and use data. Use python, SPSS, spsspro and other software to visualize the data.

Data security protection and data integration: Blockchain technology is introduced to ensure the security and privacy protection of user data, and security measures such as encryption and identity verification are taken to prevent data leakage and abuse. Integrate the analysis results with the medical system to realize data interaction and sharing with doctors, hospitals and other medical institutions to provide more comprehensive medical services.

3.7. Product advantages

1. Appointment physical examination function: when the data is abnormal, help the user make an appointment with a hospital close to the user for physical examination, which avoids the long-term vacuum period of people's semi-annual physical examination, and also avoids the inability to determine the specific physical examination items due to lack of data.

2. Introduce blockchain: By introducing blockchain technology, the secure storage and sharing of medical wearable device data can be realized while protecting user privacy. The decentralization and

immutability of blockchain technology can increase the credibility of data, attract more users and partners, and thus increase profitability [2].

3. Real-time monitoring of the combination of AI and artificiality: Through the data collected by wearable devices, the user's physical condition can be monitored in real time, abnormal conditions can be detected in time, and analyzed and processed. Personalized customization service: By collecting and analyzing data from medical wearable devices, users can be provided with personalized health management and prevention plans. This increases user engagement and loyalty, and charges a fee for these customized services. Personalized customization services can meet the individual needs of users and improve user experience and satisfaction. The addition of AI will make data analysis more accurate and faster.

3.8. Management and maintenance strategy of software information system

1. Determine data security policies: The medical wearable data analysis software information system contains a large amount of sensitive medical data, so strict data security policies must be adopted, including data encryption, access control, backup and disaster recovery.

2. Establish a monitoring mechanism: Establish an effective monitoring mechanism, regularly check the operation of the system, find problems and deal with them in a timely manner, and ensure the stability and reliability of the system.

3. Establish a maintenance team: Establish a professional maintenance team, including system administrators, technical support personnel, data management personnel, etc., to ensure the normal operation of the system and the integrity of the data.

4. Regular update and maintenance: Regularly update software and hardware devices to ensure system compatibility and performance optimization, and also back up data regularly to prevent data loss or damage.

5. Establish a user training mechanism: In order to enable medical workers to make full use of the medical wearable data analysis software information system, establish a user training mechanism and provide users with training and technical support on a regular basis.

6. Establish a problem feedback mechanism: Establish a problem feedback mechanism, collect user feedback and suggestions in a timely manner, improve and optimize the system, and ensure that the system can meet the needs of users.

7. Establish a service agreement: Establish a service agreement to clarify the service content and service standards provided by the system, and also clarify the rights and obligations of users to maintain the normal operation of the system and the legitimate rights and interests of users.

3.9. Ensure system security

1. The health monitoring system is running 24 hours a day, so as to ensure the accuracy of the data and the timely detection. Therefore, quality is the basic guarantee of software work, we must do a good job in the security monitoring system of the system, effectively prevent the intrusion of hackers, and the after-sales service system should also be carried out in an orderly manner to ensure that the follow-up work does not leave trouble.

2. With the popularization of information technology, the information system generates more and more data every day, and the system is required to manage these data reasonably. Data management can be divided into data backup and recovery, which cannot be ignored in system operation. Because no matter how secure the system is, there is no 100% guarantee that there will be no problems. Such as hacker attacks, computer crashes, etc., resulting in data loss. To do this, it is necessary to do a good job of data backup and recovery.

3. Application of blockchain technology in data analysis software for medical wearable devices:

(1) Data security and privacy protection: Blockchain technology can provide decentralized data storage and encrypted transmission to ensure the security and privacy protection of medical data. Every data transaction will be recorded on the blockchain and cannot be tampered with, ensuring the integrity and credibility of the data.

(2) Data sharing and interoperability: Through blockchain technology, different medical wearable device data can be securely shared and exchanged, promoting the interoperability of medical data and providing more data support for medical research and diagnosis.

(3) Decentralized data management: Blockchain technology can realize decentralized data management, eliminate the problem of single point of failure in the traditional centralized data storage system, and improve the stability and reliability of the system.

(4) Smart contract application: Blockchain technology can realize automated data transactions and authorized access through smart contracts, for example, medical institutions can authorize specific research institutions or doctors to access specific medical data through smart contracts, which improves the efficiency and transparency of data transactions [3].

(5) Data traceability and tracking: Blockchain technology can realize the traceability and tracking of data, ensure the traceability of the source and transmission process of medical data, and improve the credibility and controllability of data.

In general, the application of blockchain technology in data analysis software for medical wearable devices can improve the security, credibility and operability of data, promote the safe sharing and utilization of medical data, and bring more innovation and development opportunities to the medical and health field.

4. Prevent virus intrusion:

With the advancement of science and technology, there are more and more computer viruses, which are very destructive to the software system, which may cause the software system to be paralyzed and make the system management in trouble. Therefore, we must attach great importance to the harmfulness of computer viruses and strengthen preventive measures against all kinds of viruses. First of all, the company can build a local area network for the use of only workers, and install genuine, professional firewall software and efficient antivirus software according to actual needs, such as Kaspersky Lab, Comodo, Norton, Dr.Web, etc. These softwares have the functions of automatic protection and detection and killing of ordinary computer viruses, and have a certain protective effect on information system software. In addition to this, the software must be regularly checked, upgraded, or updated to enhance the self-protection ability of the information system. You can also use the network processor to improve the performance of the firewall, try to use more advanced scientific and technological means to prevent the intrusion of various viruses, and effectively ensure the security of user information. Second, employees should develop a strict virus prevention system to minimize the source of the virus. For example, company employees must prohibit staff from browsing spam websites or downloading unknown plug-ins, and prohibit non-staff members from entering the workplace to use the company's electronic devices to avoid active proximity to viruses. Once someone is found to have violated the rules, the punishment must be strictly implemented according to the system. Finally, an intrusion detection system device can be installed to monitor traffic conditions. When encountering abnormal access, the device will send out an alarm, and the network operation and maintenance personnel can deal with it in time, and can use the intrusion detection system to trace the specific IP address of the attacker and even find the attacker, so as to completely solve the security crisis of the information system software.

5. Strengthen user identity authentication and permission control

The system is used by a large number of people, which increases the possibility of information leakage. This requires system settings to strengthen user identity authentication and access control. Identity authentication generally adopts the method of "user name + password", but this single method can no longer meet the security requirements of information system software, so the combination of identity authentication and authority control can be used to strengthen the security management of information system software. For example, in terms of identity authentication, the company's staff can only be authorized to operate the information system after filling in the authorization form and obtaining the approval and seal of the department, the user password must be changed frequently to prevent the account from being stolen, and the account of the departing employee must be revoked in time. In terms of authority control, the company can set different operation permissions according to the position level of the staff and their needs. The database is the top priority, so the right to use the database can only be

mastered by the core operation and maintenance personnel of the information system and the company's senior management, but they are not allowed to make any changes to the relevant data of the database, and the password setting of the database must be complex and changeable. In addition, database queries require the consent of leadership before they can be operated. Of course, the access control methods of these systems can also be appropriately adjusted in combination with the actual situation of the hospital to make the information system more secure and reliable.

3.10. Interface View

In order to ensure that you can see the general functions of the product more clearly, we have designed the interface view for your reference.
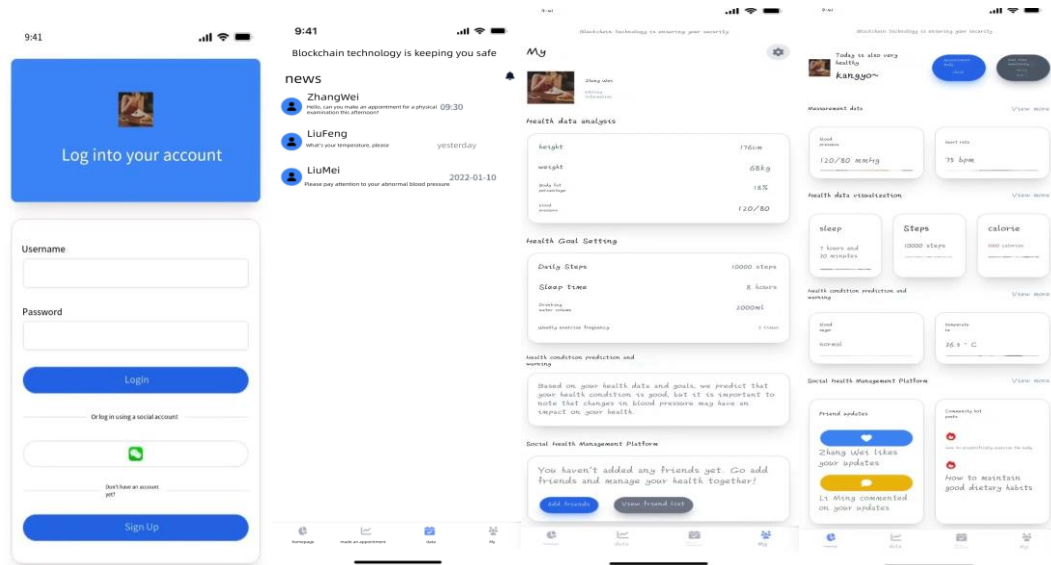

Figure 4. App interface design

4. Product features

Compared with some medical wearable device data analysis software on the market, our software has its own unique features that distinguish it from other software:

4.1. User-Friendly

Health data analysis software can provide an easy-to-use interface and functions, and users and doctors can easily use the application to better monitor the user's physical condition in real time, detect abnormalities in time, and analyze and deal with them.

4.2. Validity

Using modern technology, more intelligent algorithms and big data analysis can be used to achieve efficient physical condition assessment and analysis, so as to improve the speed and accuracy of diagnosis.

4.3. Innovation

The appointment physical examination function of the software can help the user make an appointment with the nearest hospital for physical examination when the data is abnormal, which avoids the long-term vacuum period of people's semi-annual physical examination, and also avoids the inability to determine the specific physical examination items due to lack of data, and at the same time, the effective physical examination can detect the changes brought about by some chronic diseases or asymptomatic diseases in the early stage as soon as possible, which is conducive to early treatment and increases the probability of recovery.

4.4. Security
Safeguard patient privacy and data security. Blockchain technology is introduced to encrypt and protect data to avoid the leakage of patients' personal privacy and the loss and theft of data.

5. The innovation of the project
In order to facilitate patients, customers, pharmaceutical practitioners or companies to use medical wearable device data analysis software more conveniently, our software has made innovations on the basis of basic functions on the market, and it is also more convenient to realize the concept of "Internet + medicine". At the same time, we have also roughly designed the charging scale of the software so that it can meet the needs of consumers with different needs.

5.1. Measurement data
Through the more accurate data measured by health data analysis software and big data analysis and processing, some abnormal changes in the body can be detected as soon as possible, and the measurement data of wearable health devices can also be used for later disease analysis and treatment.

5.2. Appointment for medical examinations by the software
When the data is abnormal, help the user make an appointment with a hospital close to the user for physical examination, which avoids the long-term vacuum period of people's semi-annual physical examination, and also avoids the inability to determine the specific physical examination items due to lack of data, and at the same time, the effective physical examination can detect the changes brought about by some chronic diseases or asymptomatic diseases in the early stage as soon as possible, which is conducive to early treatment and increases the probability of recovery.

5.3. Real-time monitoring and analysis
Through the data collected by the wearable device, the user's physical condition can be monitored in real time, abnormal conditions can be detected in time, and analyzed and processed. Personalized customization service: By collecting and analyzing data from medical wearable devices, users can be provided with personalized health management and prevention plans. This increases user engagement and loyalty, and charges a fee for these customized services. Personalized customization services can meet the individual needs of users and improve user experience and satisfaction.

5.4. Data Visualization
The collected data is visualized and presented to users with intuitive charts and reports, allowing users to better understand their physical condition and health status.

5.5. Scientific prediction and early warning
Through the analysis and comparison of a large amount of data, scientific prediction and early warning can be carried out, possible health problems can be detected in advance, and corresponding measures can be taken.

5.6. Introduction of blockchain technology
By introducing blockchain technology, the secure storage and sharing of medical wearable device data can be realized while protecting user privacy. The decentralization and immutability of blockchain technology can increase the credibility of data, attract more users and partners, and thus increase profitability.

5.7. Product Pricing
1. For medical institutions and research institutes, we can employ a high-value pricing strategy. These users have a high demand for features such as high-precision data analysis and booking medical check-ups, so they are willing to pay a higher price for high-quality services. We can provide customized

services, such as in-depth customization of data analysis reports, system integration services, etc., to increase added value. At the same time, consider subscription pricing, where you charge monthly or annually for usage to ensure a continuous revenue stream.

Therefore, for medical institutions and research institutions, we adopt the strategy of split-version pricing, that is, we will price the basic version at 3000 yuan/year, that is, there is no need to pay additional costs after purchase, and the specific functions include: the most basic data reading, data export, AI analysis suggestions for basic classes, speed limit for ordering physical examination users, and basic expert analysis.

The premium version is priced at 8,000 yuan/year, which means that there is no additional cost after purchase. Specific functions include: advanced data reading, advanced data export (i.e., data confidentiality, security, and export speed enhancement), advanced AI analysis suggestions, priority recommendation for appointment medical examination orders, and analysis and consultation suggestions by senior professional experts.

2. For individual users, we can adopt a penetration pricing strategy, which is to set a lower price initially to attract users, and then gradually adjust the price. We can provide a basic version of the analytics service, which covers basic data analysis and appointment functions. In addition, we can also provide value-added services, such as personalized health advice, advanced data analysis, etc., to meet the needs of different users, and adopt the "free + value-added services" model to attract and retain users.

Therefore, for individual users, we adopt a subscription system. Basic version: 79 yuan/month, 900 yuan/year. Specific features include: basic data visualization, data analysis, limit the number of appointments for medical check-up orders, simple personalized recommendations, etc.

Premium: 109 RMB/month, 1200 RMB/year. Specific functions include: advanced data visualization, advanced data analysis, AI analysis, personalized recommendations, priority recommendation for appointment medical examination orders, senior expert consultation, etc.

In the implementation of the pricing strategy, we also need to consider the pricing strategy of our competitors and the overall price level of the market. We can gather information through market research and adjust our pricing strategy accordingly to ensure that our products are competitive in terms of price and functionality.

6. Summarize the recommendations

As a new technology, medical wearable devices have been widely used in the medical field. These devices are capable of collecting and monitoring the patient's physiological data, which is processed and interpreted through data analysis software. This article will explore the conclusions of data analysis software for medical wearables and its implications for medical practice.

First, medical wearable device data analysis software can provide accurate and real-time data analysis results, which can help doctors and nurses better understand the health of patients. By analyzing a patient's physiological data, doctors can gain a comprehensive understanding of changes in heart rate, blood pressure, oxygen saturation, and other indicators. The results of these data analysis can help doctors better assess the patient's condition and develop more effective treatment plans. At the same time, real-time data analysis results can also provide rapid response in emergency situations, helping doctors take necessary treatment measures in a timely manner, thereby improving the survival rate and recovery rate of patients.

Secondly, the conclusions of the medical wearable device data analysis software can be used for disease prevention and health management. By analyzing data from a large number of patients, doctors can identify patterns and risk factors for some common diseases. These findings can help physicians develop preventive measures, alert patients to potential health problems, and intervene accordingly. In addition, medical wearable device data analysis software can also be used for health management, helping individuals monitor and manage their own health status. By analyzing an individual's physiological data, the software can provide personalized health advice and guidance to help people better stay healthy and prevent disease.

However, medical wearable device data analysis software also faces some challenges and limitations. First of all, the accuracy and reliability of the data is an important issue. Since a patient's physiological data is collected through sensors, the accuracy of the data can be affected by a variety of factors, such as the quality of the sensor and how it is used. In addition, data security and privacy protection are also a key issue. The data collected by medical wearables contains an individual's health information, and if this data is leaked or misused, it will pose a serious threat to the privacy and personal rights of the individual.

To overcome these challenges, medical wearable device data analysis software requires continuous technological improvements and innovations. First, there is a need to improve the quality and performance of the sensor, and improve the accuracy and reliability of the data. Second, it is necessary to strengthen data security protection measures to ensure that patients' privacy and personal rights and interests are effectively protected. In addition, there is a need to strengthen the training of doctors and nurses to improve their ability to use and interpret data analysis software for medical wearable devices to better realize the potential of this technology.

In summary, the conclusions of the data analysis software for medical wearable devices are of great significance for medical practice. It provides accurate and real-time data analysis to help doctors better understand the health of their patients and develop more effective treatment plans. At the same time, it can also be used for disease prevention and health management, helping people to better stay healthy and prevent diseases [4]. However, it also faces some challenges and limitations, such as the accuracy and reliability of data, data security, and privacy protection, etc. [5]. To overcome these challenges, continuous technological improvements and innovations are needed to enhance data accuracy and security protections, and to improve the usability and interpretation of data by doctors and nurses. Only in this way can medical wearable device data analysis software better play its role in medical practice.

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