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Design of Persuasive APP Based on IOS System-- Taking Intelligent Mask as an Example

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Design of Persuasive APP Based on IOS System-- Taking Intelligent Mask as an Example

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Abstract. Based on the research of existing air monitoring and the research of APP products, the author is based on experience design and emotional design, from the perspective of human-computer interaction design, to explore better communication between users and intelligent products at emotional level. Through the analysis of the emotional design of products, we completed a set of persuasive APP design based on IOS flat system. Based on DOAS's working principle, we can get real-time data from environment and connect with mobile's APP, it is convenient for users to choose their own travel, to solve a series of health problems caused by environmental problems and people are concerned about their own health .

1.Introduction

With the rapid development of China's economy, it has greatly improved the living standards and family income of the general public, and it has also brought about the problem of environmental degradation in various places. According to the survey data of air quality problems in China last year, China's environmental problems are extremely serious. Although the government has taken various measures, it has no immediate effect on environmental control. At present, there are many healthy APP products and wearable devices that are becoming more and more perfect, but there are not many smart wearable devices that are specifically targeted at environmental issues. For the continuity of user experience, masks are the most direct solution and equipment to solve the health problems caused by environmental pollution. Studying the availability of smart masks and designing relevant apps is to achieve good human-computer interaction. The important way to implement the design concept of "central" and "human-machine-system" is to pay attention to environmental issues as an important manifestation and concrete realization of concerns about their own health problems. Based on the experience design and emotional design theory, this paper creates environmental data monitoring and user data based on the analysis of product emotional design and the environmental monitoring algorithm based on DOAS working principle. The interface of the main functions such as dynamic sharing interaction, regional real-time data statistics, and user communication in the same area at the same time, feedback data to the user through the extraction of official data and GPS positioning, and can record environmental data when connected with the terminal. The author has completed the design of data visualization as a functional requirement, which provides reliable data protection for user travel.



2.Environmental monitoring data and design investigation based on IOS platform

In this study, wearable smart device was discussed that adjusts the electrostatic protection size through the data monitoring of GPS positioning and mobile phone applications. It is proposed that an environmental quality assessment of the external environment can be performed indoors by obtaining official data to determine whether the wearable device is required to be out. In an outdoor environment, the data can be analysed and detected by the optical quality sensor, the environment can be evaluated, and the protection settings can be adjusted by the app to achieve self-protection.

2.1. Requirement analysis of environmental monitoring algorithm

As an environmental monitoring system, it is necessary to real-time monitor the environment changed, and the monitoring results of data and images directly fed back to users. Whether users are pollen-allergy or block pm 2.5, it could be able to measure the environmental data that they need to make corresponding adjustments of the electrostatic protection of the mask according to the environment. Therefore, there is a need for an accurate algorithm for real-time data collection and analysis monitoring that provides real-time feedback to the user on behalf of the user's air quality data in their environment.

The environmental monitoring system consists of three parts: data collection, background data processing, and mobile application. Through data acquisition of sensors, data simulation conversion is transmitted to the background for data analysis and processing. The system uses the database for screening analysis, when the harmful substances in the air and the concentration exceed the standard, the system sends a warning notice to the mobile phone, and the data is displayed through the mobile application interface. Display various pollutants and pm2.5 concentration curves in the APP, and show them to users, users can intuitively and quickly understand the changes in airborne pollutants and pm2.5.

2.2. Applied research on persuasive design

A good lifestyle requires the individual, the public, and the society to work together in many ways. The correct behavior requires a guided process and persistence. This APP product is a self-health persuasion platform based on environmental testing, providing users with real-time environmental information and reminder services. The platform allows users to have a precise understanding of the pollution situation in their environment and prompts users to make corresponding feedback interactions. In persuasive design, the app can persuade people to pay attention to their environment and their health, and the continued use of this app will protect the health of themselves and their families.

In the process of user use, the interaction between the application and the user is mainly reflected in: guide the user to promote environmental awareness and protect their own health through persuasion, and let users generate intent to use the product. Provide a social platform for users through the mobile application platform when the user's behavior is persuaded to change, collect data and share data feedback. The persistence of these user behaviors is achieved by different persuasion methods. In the process of user interaction with products and services, Persuasive design uses different motivations, trigger factor to attract users' abilities, motivations, and trigger points. At the stage where user behavior is persuaded to change, through the attention to the details of the user's behavior, use different methods of persuasion to achieve the goal. It will eventually become one of the long-term lifestyles that users must own.

2.3. Design survey and result analysis based on smart wearable devices

In the design process of smart wear matching APP, the number of applications and installation rates of smart wearable connection apps is increasing. Questionnaire survey found that people are highly accepting smart wearable devices, but did not pay attention to the user experience in the connection between smart hardware and APP, and insensitive to the guiding interactions in UI design. Therefore, in the APP design, the following aspects should be considered:

- At present, the smart mask on the market has a single function, cannot be connected with the APP, cannot carry out the user experience, and has no detection function. In the face of no reference data, only official data can be used, and users cannot take corresponding measures;
- Data visualization should ensure that data analysis is clearly visible and the data displayed in the app is intuitive and easy to read;
- Enhance communication and interaction between users and improve user viscosity;
- Set automatic defense on function in APP to reduce manual operation by users.

3. Analysis of APP development process

Mask is software based on real-time air quality detection, it is combined with a hardware smart mask to protect users from air pollution sources and PM2.5. When the Mask is linked to the mobile app, it can send the complete access data of the environment the user is in. The app provides a real-time air quality report and corresponding regional air quality map. Get data in real time from the user's environment and turn it into actionable advice, such as: when the PM2.5 concentration exceeds the normal value; the application will give operational advice and defense by adjusting static electricity protection. From the concept to the product entity, after the hardware preparation is completed, before the development of APP program, it is necessary to carry out a well-organized product analysis. During the development process, the rationality of the functions and interactions is judged by the product requirements Sections, subsections and subsubsections.

The use of sections to divide the text of the paper is optional and left as a decision for the author. Where the author wishes to divide the paper into sections the formatting shown in table 2 should be used.

3.1. Demand analysis

Mask is an environmental monitoring and protection software, it has a clear guidance from the user's needs. Through the functional analysis of product requirements, divide the application purpose of Mask software into the following four functions: equipment, record, share and map. It also has access to the following classification information:

- Functional requirements of the record: through the acquisition of intelligent hardware data, send to the mobile phone using Bluetooth, visual display the mobile phone interface;
- View recent data by swiping and it can be used for data analysis and comparison;
- The shared content can be shared by screenshots to third-party software such as WeChat, QQ, Weibo;
- Dynamically share and chat with other users, friends can comment and like in real time;
- Uniform and rich visual style.

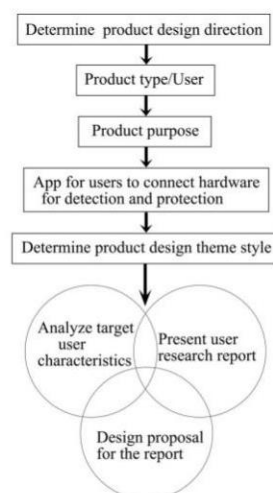


Fig.1. UI vision Design Process

Through the above analysis, four user demand dimensions can be set, including data analysis, my equipment, map, and personal center. The functional structure of the APP is divided into the following four aspects:

- The design of the data: guided by visualization and legibility, and provides users with statistical display of the data in a beautiful and concise view;
- Design connectivity: the display of the matching connection between the intelligent hardware and the APP removes the complicated function interface and forms a simple function display;
- The design of the map: after positioning, the icon shows the surrounding environment. Through the use of the official data from the Environmental Protection Agency, the user have a preliminary judgment;
- The design of the Personal center: Based on the function of displaying push friends and analyse personal activities. Increase the user's stickiness to the app through interactivity.

3.2. Identify target users

Mask users are not specifically defined by age or gender. Therefore, this product is mainly for users who are concerned about their own health. The target user's positioning can quickly convert the product concepts, ideas and functions required by the target user into a well-organized product. As shown in Figure 1, the UI visual design process for the product Foot notes

Foot notes should be avoided whenever possible. If required they should be used only for brief notes that do not fit conveniently into the text.

3.3. Mask information architecture and process design

In the early stage of design, the main functions of the product are roughly divided by means of information architecture diagrams. Use the text framework to list the features of the product for further analysis and supplementation. The program mainly focuses on the visual display and data sharing of data. According to the demand analysis, the information architecture diagram divides the products into four categories: equipment, data statistics, map, personal center. The information architecture diagram is composed as shown in Figure 2, from this functional information structure, further interactive flow chart analysis, the product function jump and switch to a detailed decomposition description, as shown in Figure 3. According to functional requirements, Divide product information into:

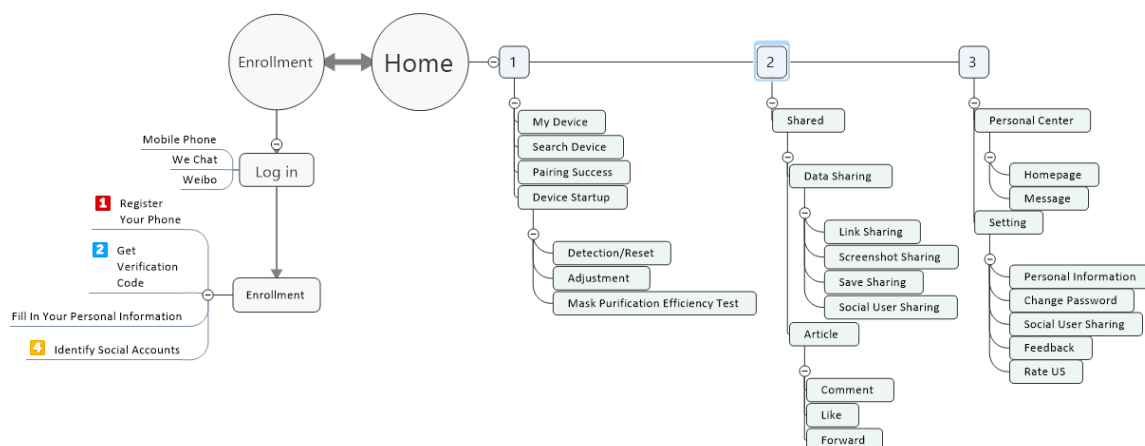


Figure2. APP information architecture diagram

- Login to register homepage: including mobile phone, email, third party login;
- Main interface section: including my equipment, shared, personal center, set;
- In addition to connecting the search function block, my equipment information framework also includes boot hardware for detection;

- The shared framework uses search neighbors and user repositories to increase user friends who use the same equipment. After joining the group, data sharing and information exchange can be performed;
- Personal Center: including homepage and messages, as well as comment forwarding for published articles;
- Setting up the framework: including data modification and viewing of other product information. According to the APP information architecture diagram, the detailed interaction flowchart shown in Figure 3 is completed, and the product function flow is completed through the graphic and text mode, and a clear logic idea is determined for the next APP design.

4.Design and display of UI interface design effects set by data visualization

The trend of the APP design interface is no longer the pursuit of beautiful, dazzling dynamic effects, but more attention to the user experience, visual comfort. The design further visualizes the visual read ability of the detected data as a design requirement in a data visualization manner. Eliminate complex functional interfaces, form simple data to check, hardware can be adjusted to the main function of the design. Mask in gray #4d5359 as the main background of the overall color with a

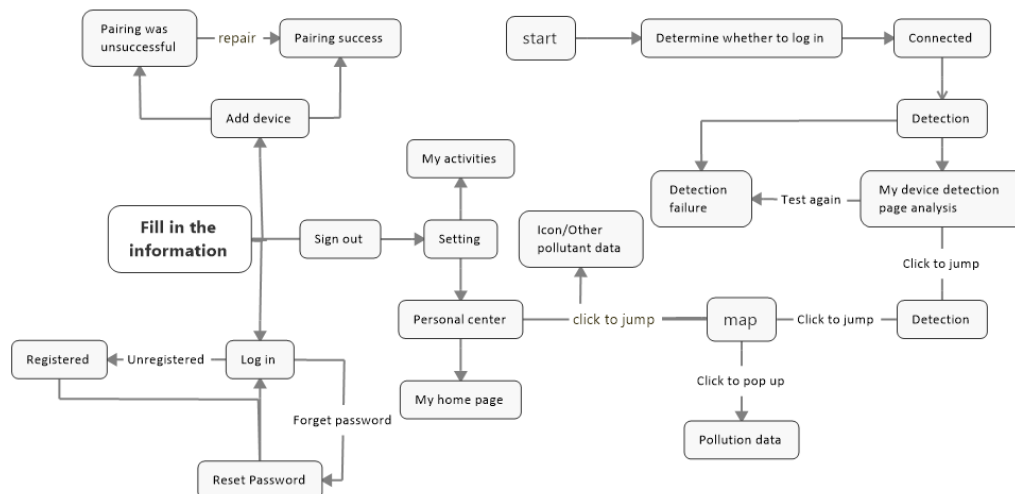


Figure 3. Interactive flow chart

transitional color, it looks more layered. The space is mostly based on ghost space, so that users can focus on the content. The overall color system is a cool color system, which mainly shows a visual perception of serious environmental pollution, which makes users pay more attention to environmental issues.

The shape of the Icon design is directly derived from the simplification of the mask, abstracted into a simple mask shape for identification. Gray-black background and low-saturation pattern have a warning effect on environmental degradation, thereby narrowing the distance between the product and the users. Reduce the burden of reading during user use. In each button, paragraph, form, you need to make a visual distinction by blanking. In the interface layout layout, it is necessary to understand the user's psychology and use a scientific visual method to visually guide the user. The bar and spacing, the spacing between the text and the line segment, and the proportion of the image select the golden ratio; in the global typography, by increasing the rhythm of the layout, the mask is used to control the tone of the image to make the interface complete and coordinated. According to the above functional analysis and usage requirements, the function pages of the APP design completed according to the user requirements as shown in Figure 4 to Figure 11 are completed. Each page also contains the details of the function page. Function allocation to meet the user's various needs.

5. Conclusion

At present, smart wearable devices and apps are mainly focused on the measurement of the number of motion steps, and the calculation of the calorie time is a basic function. Therefore, the combination of smart wearable devices and app applications will generate a large market demand. The paper will provide some reference and help for the research and development of similar or similar test products through the development of mask-based APP products, including interactive design and UI design. Nor does it pay more attention to the external environment and its own health problems. It proposed a certain persuasion method, the design schemes for easy operation, data sharing and visualization to solve such problems are given.

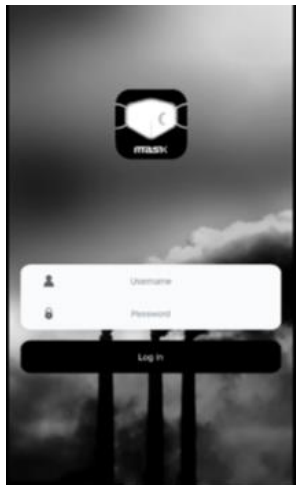


Fig. 4. Login Registration



Fig. 5. Data Display

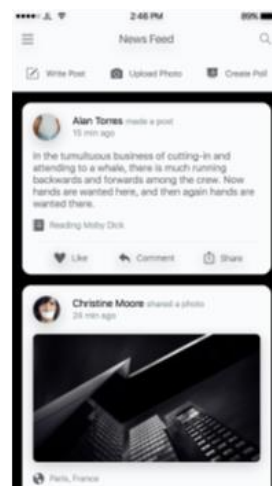


Fig. 6. Personal Home

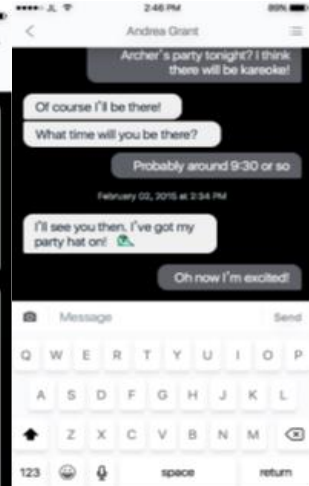


Fig. 7. User Dialog



Fig. 8. Data Monitoring



Fig. 9. Pairing Connections



Fig. 10. Personal Activity Detail

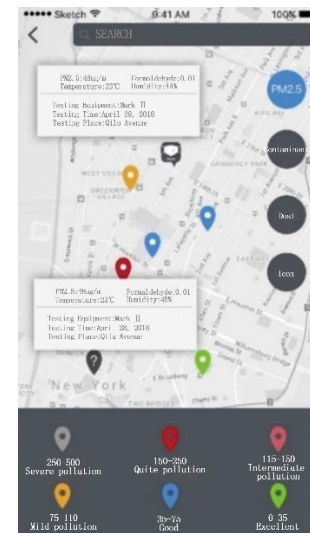


Fig. 11. Map UI

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