



An Interaction Design Approach of Fitness APP

Jun-Qi Wang¹(✉), Jing-chen Cong², Zhi-yuan Zheng³, Yang Meng⁴,
and Chao Liu⁵

¹ School of Arts, Tianjin University of Commerce, Tianjin 300134, China
2767458713@qq.com

² School of Mechanical Engineering, Tianjin University, Tianjin 300350, China

³ School of Design and Arts, Beijing Institute of Technology,
Beijing 100081, China

⁴ Lian Xian Education of Tianjin, China, Tianjin, China

⁵ Baidu, Beijing, China

Abstract. At present, the number of App users in China is soaring, but it still faces the problem of low user stickiness. The interactive design approach of fitness App is proposed to improve the App and motive users to form the habit of permanent use of fitness App, and ultimately achieve the goal of increasing the fitness App's stickiness. The ideal fitness App lifecycle can be divided into three stages: the initial trial stage, the habit-forming stage, and the habit-keeping stage. It is proposed that fitness App should improve user experience in three stages of the ideal lifecycle by improving interaction design at the three levels of "instinct level, behavior level and reflective level". The specific interaction design approach at the instinct level, behavior level and reflective level are also put forward.

Keywords: Motivation theories · Fitness apps · Interaction design

1 Introduction

Fitness App is a kind of sports assistant tool which provides users with fitness knowledge, formulates fitness plans, shows exercise courses and recommends recipes according to different physique. It attracts a large number of users for its advantages, such as unlimited time and space, customizable courses and detailed records of sports data.

Nowadays fitness is becoming more and more popular in China. The number of people who often take physical exercise in China is increasing year by year. By 2020, the sports population in China is expected to reach 435 million [1]. However, with the growth of national fitness demand, the limited national public sports resources and high gymnasium fees have limited the national fitness aspirations. Therefore, fitness App has gained a large number of users with its advantage of being unrestricted by the venue. The user scale, average daily use time and average daily use frequency are all in a steady growth trend. By June 2018, the industry penetration rate of fitness App was 9.5%, and the number of users reached 104 million. The average daily use time per user

lasted up to 20.17 min, rose by 30.8% year-on-year. The average daily use frequency per user was 3.05 times, rose by 20.08% year-on-year [2].

At present, the research on fitness App mainly concentrates on the realization of fitness function and fitness technology process. The single research on fitness App users mainly focuses on sports education and physical & mental health of teenagers, including the use of fitness App for college students [3, 4], and the physical activity [5] motivation of fitness App for students and young people [6]. While in China, the fitness habits of the nationals are developed late, so fitness App face the problem of how to help users develop fitness habits. The core problem that needs to be solved in the interactive design of fitness App is how to motivate users to generate fitness behaviors and keep on doing fitness by the continuous usage of App.

2 Motivation Theories in Fitness App

The word “Motivation” comes from the Latin word “Movere”, which original meaning is promotion or participation in an activity. According to Atkinson, motivation refers to the impact of the direction, intensity and sustainability of the action at this moment [7]. Motivation model is the application of motivation theory. Researchers extract and classify the motivation elements of motivation theory, and establish motivation model for practical application. It includes a theory of intrinsically motivating instruction [8] proposed by Malone, Fogg Behavior Model (FBM) [9] proposed by Fogg, and the ARCS model proposed by Keller etc. In which ARCS, referring to the four elements of Attention, Relevance, Confidence and Satisfaction, it emphasizes that to realize the function of motivating learners to learn, the motivation to inspire learners must be combined with the application of these four elements [10]. Combined with the theme of fitness, ARCS motivation model is applied to fitness: (1) Attention. Inspire interest and maintain attention through colorful presentation and novel tasks. (2) Relevance. Connect training content with reality, which is to help users understand which skills can be improved through training, and what does it mean for real life. (3) Confidence. Help users build confidence and believe that they have the ability to achieve fitness goals. (4) Satisfaction. Give positive feedback and encouragement to users’ fitness achievements. Fitness App need to motivate users to have fitness through the App and cultivate their long-term fitness habits. The core of cultivating habits is to establish a relationship between “pay” and “reward”, and the key to establishing a relationship lies in the appropriate motivation mechanism.

3 The Relationship Between Ideal Lifecycle and Interactive Design on Fitness App

Fitness App cultivates users’ habit of using the App to assist fitness through the way of motivation, thereby reducing users’ withdrawal and abandonment due to fatigue and laziness, and strives to develop the user’s continuous fitness behavior into regular App use for fitness in the process of repeated use. The ideal fitness App lifecycle can be divided into three stages: the initial trial stage, the habit-forming stage, and the

habit-keeping stage. The initial trial stage is the process of gathering users' information to the willingness to perform or having completed the first workout. After the initial fitness behavior, users continue to use App to assist in fitness. With the increase of fitness frequency and satisfaction, the user enters the habit-forming stage. With the accumulation of user fitness data, the user stickiness of the system will also exhibit nonlinear enhancement. Users regard App as a regular fitness aids, gradually develop lifelong fitness habits, and enter the habit-keeping stage.

It is mentioned that in this article, the system motivates users to use App to assist in fitness by enhancing interactive design. Donald Arthur Norman put forward three levels of design: instinct level, behavior level, reflective level [11]. This study proposes that fitness App should improve the user experience in the three stages of "initial trial stage, habit-forming stage, and habit-keeping stage" by refining the interaction design at the three levels of "instinct level, behavior level and reflective level".

The initial trial stage corresponds to the instinct level of interaction design, which is very strong in the sensory stimulation, to meet the basic requirements of users for their survival needs, so as to inspire users' interest at the beginning of contacting fitness App. At this stage, interaction design should pay more attention to the system content. Continuous use stage corresponds to the behavior level of interaction design, which reflects the user's behavior when using the product. It is the level of user's perception from physiology to psychology. At this stage, interaction design should focus on the design related to practical function and good service. Permanent use stage corresponds to the reflective level of interaction design, which pays more attention to personal emotions. The interaction design of this stage pays more attention to users' social needs, respect needs, self-fulfillment needs, and makes the users generate the emotional resonance, and establish a permanent relationship with the system naturally.

4 Interactive Design Approach of Fitness App Based on Motivation Theories

Interaction design is a new subject separated and developed from the field of human-computer interaction [12]. Shneiderman puts forward the interaction design approach for most interactive systems [13]. On this basis, this study proposes that fitness App can be designed to motivate users at different stages by following the principles of interaction design at different levels, as shown in Fig. 1.

4.1 Interaction Design Approach at the Initial Trial Stage

1. Ensuring that the content and functionality meet the basic needs of users. Health factors belong to the most basic physiological and safety needs of Maslow's hierarchy of needs [14]. Adhering to physical fitness to maintain good health has become the most basic user demand of using fitness App. Fitness App should provide professional and detailed fitness records, scientific and standardized fitness guidance and detailed fitness data to help users know the physical activity every time and better achieve fitness goals. Take Keep as an example, Keep provides a

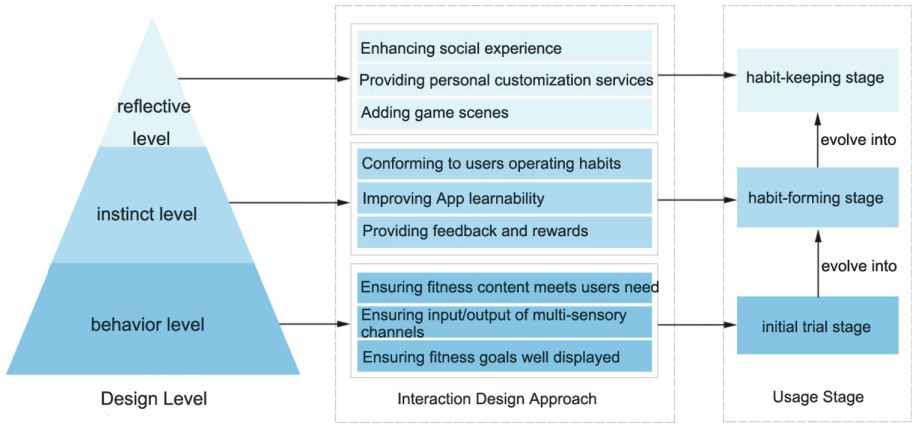


Fig. 1. The interaction design approach of fitting app

novice entry area for first time users of the App, including knowledge and information about fitness, diet and basic introductory training courses for novice. It also provides entrance for fitness ability test and physical data collection, as shown in Fig. 2. And formulates fitness training plan according to the user’s gender, age and fitness needs, to help novice quickly complete the Entry stage of fitness.



Fig. 2. Fitting plan content page (Picture Source: Keep App)

2. Ensuring the input and output of multi-sensory channels. Fitness App should adopt visual, auditory and tactile senses to transmit information more effectively. Meanwhile, it should expand the channels for system to receive information. Visual feedback is still the most important form of feedback. But when exercising, mobile devices are often worn on the wrist or tied to the arm. To ensure the fluency and safety of the exercise, auditory and tactile feedback will be better than visual feedback. “Lemon Running” is a fitting App which mainly provides running services. When

users use the App, the intelligent devices are usually worn on the arms. It is inconvenient to check the device interface to know the running progress. So every time when users complete the running mileage of one kilometer, the vibration reminder and voice broadcast of the device can transmit the information of the completed mileage and the moving speed to users, and provide voice encouragement when the user is about to complete the process, so that users can get their own real-time information without having to read the interface and get a better sports experience.

3. Ensuring the fitness goals are clearly displayed. It is necessary to clearly show the goal of fitness, so that users can clearly understand the effect of completing exercises. App can quantify the movement data to make people feel the benefits of exercise more intuitively. The target difficulty should be matched with the user's own skills, or be slightly difficult, and long-term goals should be divided into some short-term goals, to motivate users to complete the challenge step by step, and gain a sense of achievement and satisfaction in the process of approaching the goal. According to the whole fitness cycle of the user, Hot Fitness App displays the daily fitness training consumption and diet guide in the form of progress bar, as shown in Fig. 3. Users will know their current fitness process in real time and get the fitness results in advance, further more have a better understanding of the entire fitness plan framework. All in all it will help users build confidence and inspire motivation to implement their own fitness programs, and make users believe that they have the ability to achieve the fitting goals.

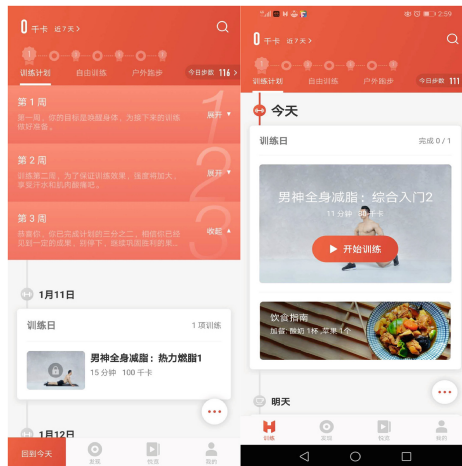


Fig. 3. Fitting plan content page (Picture Source: Hot Fitting)

4.2 Interactive Design Approach at the Habit-Forming Stage

1. Conforming to users' operating habits. Fitness App should conform to users' operating habits, and the final interactive interface should match the user's mental model of the system. In the sports scene, users hope to understand the main

functions and operation modes of the App quickly, and put into training as soon as possible. App fits for matching narrow and shallow navigation design, with simple and easy-to-use operation process, and well-known interactive gestures to reduce learning cost. As shown in Fig. 4, in the running module of Mi Sports App, a reasonable interactive gesture can avoid the users' misoperation during the operation of pause and termination, so that users can clearly check their own fitting process in running time, and enhance the immersion of users.

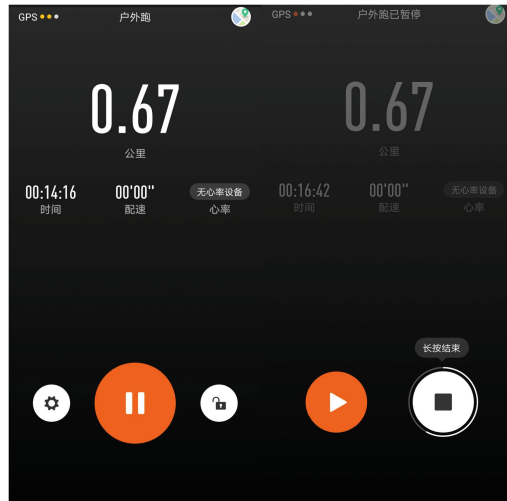


Fig. 4. Running content page (Picture Source: Mi Sports App)

2. Improving App learnability. The system can improve the App learnability by novice guidance video, primary and secondary interface design, fitting data visualization to make the system more transparent to users. The interface information levels is clearly divided, and the fonts, icons and buttons designed are unified and coordinated, which can improve the App learnability and enable users to learn the use of the App more quickly. The App will help users understand fitness actions through fitness guidance video, and help monitor the users' body by using smart connected open architecture product [16]. When fitness action is not up to standard, smart connected open architecture product will remind users or assist users to meet the standard.
3. Providing feedback and rewards. The system should provide feedback on users' fitness results at an appropriate time to avoid users' dull and bored moods. Regular rewards will inspire users' expectations, and irregular rewards will attract users' addiction. When the user is in fitness, a random reward to the user whose fitness time reaches a certain amount will bring surprise. Similarly, when the fitting plan is interrupted, the system can assist users to find the reasons, such as busy time, physical discomfort, or high goals etc., and provide corresponding solutions, something like the time extension, and the fitting plans or goals adjustment. Taking Joy Run App as an example, in order to encourage users to open App more often and run more, the App

has designed a medal award system, as shown in Fig. 5. The system is divided into six categories: Joy Run Guru, online marathon, brilliance, music life, challenging action, and invincibility. These medals cover activities, constellations, solar terms, geographical location and some other aspects. When users complete the running mileage and off-line marathon, they will be awarded medals accordingly. By collecting medals, the self-fulfilment psychology can be satisfied.

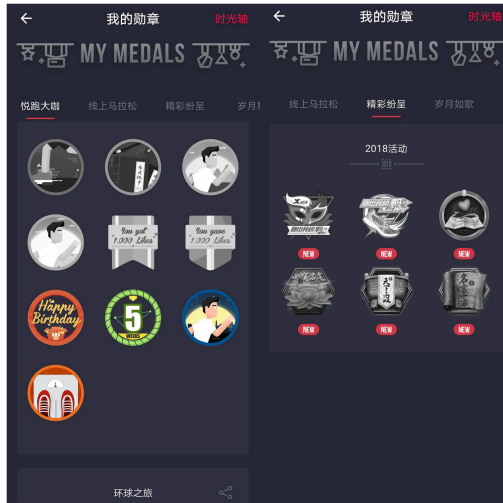


Fig. 5. Medals award system (Picture Source: Joy Run App)

4.3 Interaction Design Approach at the Habit-Keeping Stage

1. Enhancing social experience. Fitness App sets up a social network for fitness communication, which can help users get a sense of participation and belonging in social communication, and provide users with spiritual strength. The App can also show the number of training and the training results of other people in the course detailed page, to motivate fitting continuously by group psychology. Taking Rejoice Sport as an example, as shown in Fig. 6, in the circle module of the App, users can set up or join the circles they're interested, participate in interesting topics, give dynamical Likes or comments to friends, and follow users nearby. In the circles that users join, the App will rank according to the number of training minutes, the number of likes and the number of selection of every user in the circle, and list training lists, popularity lists and contribution lists, as shown in Fig. 7. On the one hand, it will provide a circle talents reference for novice users, and on the other hand, it will motivate users to have fitting actively and enhance their communication of fitness experience.



Fig. 6. Circle topic discussion page (Picture Source: Rejoice Sport App)



Fig. 7. Circle ranking list page (Picture Source: Rejoice Sport App)

2. Providing personal customization services. Fitness App can use artificial intelligence technology to formulate personalized fitting programs when setting fitting goals and plans for users. And at the same time give users the right to modify programs. It can consider the individual's learning progress and thinking changes.

Users' physical condition and training objectives will change in the process of using App to assist fitness, and the system should change and improve accordingly to help users achieve new goals at all times. As shown in Fig. 8, try - Fitness and Weight Loss App, it analyzes the recorded data according to the user's health goals, and formulates personalized programs for users to help them cultivate healthy habits



Fig. 8. Dietary calorie data record page (Picture Source: Try- Fitness and Weight Loss App)

3. Adding game scenes. Fitness App can design a game scene and create a relaxed atmosphere. This way can not only reduce the boredom of fitness, but also motivate users' interest to maintain their attention. Designers can apply the thinking and mechanism of gaming to the design of fitness App. As shown in Fig. 9, WALKUP drives the whole game by recording the number of users' steps, combined with fitting records and world travel. The App records the users' number of steps every day through the mobile device's step-counting function, converts the steps into the energy to travel around the world, and brings users with the experience of exploring cities around the world. During the trip, the App prepares a variety of interesting events and scenarios. Users can compete with their friends in the number of steps, or get rewards by completing the mission. All of these will help users enjoy the fun of fitting and games in the world travel.



Fig. 9. Game mission content page (Picture Source: Walkup App)

5 Conclusion

Starting from the lifecycle of fitness App, this article divides the ideal lifecycle of fitness App into three stages, and summarizes the interaction design approach corresponding to each stage, by combining with the three levels of interaction design. The interactive design approach of fitness App proposed in this article lays a theoretical foundation for the spread of interactive design work. Compliance with this approach, interactive design can effectively enhance users' willingness to use the system. This study is still limited to the consideration of the Chinese market. In the future work, the range of study will be broadened, and will be focused on the interactive design of global fitness App.

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