

Research on the Persuasive Design of Healthy Living Products

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Abstract. Unhealthy lifestyles are threatening human health. In order to improve unhealthy lifestyles, this paper has discussed how to help people to form a healthy lifestyle from the perspective of design. This project adopts the Fogg Behaviour Model and based on the Fogg Behaviour Grid and the Persuasive Systems Design (PSD) model, through the research of Xiaomi Smart Band 5, this paper has analysed the application of the corresponding elements of persuasive design in product design. In addition, it has proposed to improve the product performance from the aspects of motivation, ability and trigger point, so as to improve the user's ability to use the product. Subsequently, it puts forward the persuasive strategies in the formation of a healthy lifestyle in order to achieve better persuasive effects. This can help people to solve the problems that are encountered in the process of behaviour maintenance, and thus forms a healthy lifestyle.

Keywords: Fogg Behaviour Model, Persuasive Systems Design (PSD) model, healthy lifestyle.

1 Introduction

The World Health Organisation (WHO) defines Health as, “a well-integrated combination of physical, mental and social aspects, not merely the absence of disease or infirmity”^[1]. It can be seen that health is not only the evaluation standard of the human body, but it is also the comprehensive evaluation index of the mental psychology, social relations, moral ethics and other aspects. And health is closely related to human lifestyle; an unhealthy lifestyle is becoming a major threat to human health. The term ‘lifestyle’ was coined by Max Weber, a famous German sociologist, political scientist and philosopher, and was first proposed by the psychologist Adler, who stated, “It is the external form that the individual recognises in a certain society, culture and space.”

Accordingly, a healthy lifestyle refers to a state in which a person is well in the aspects of physical, mental and social under certain social, cultural and spatial conditions. In other words, a healthy lifestyle includes the three aspects of physical, psychological, and social communication, where it is manifested in the physical health behaviour, mental health behaviour, and social health behaviour.

This research is to study and design the products for a healthy life from the perspective of persuasive design, so as to change the lifestyle of the users. ‘Persuade’ is a word that has been derived from psychology, it indicates that the method of persuasion uses non-compulsory means, which makes it easier for the persuaded person to accept, and also shows the purpose of

persuasion. The original intention of persuasion is an artificial restraint method; in today's cross-disciplinary development, persuasion has more richer functions and meanings, and is widely used in various industries. 'Persuasion technology' is a term that has been formed by the intersection of psychology and computer science. It is mainly used in research to realise persuasion through computer technology. Although it has not been mentioned a lot in the industrial production, but in real life, the persuasion technology is already widely used in many fields such as in business promotion, religion, foreign affairs and politics, health management, public affairs, and so on.

2 Analysis tools and methods for behavioural design

In order to better apply persuasive design in healthy lifestyles, through the literature review, this project mainly uses three behavioural models to analyse and practice health products, and then concludes the feasibility and practicality of persuasive design.

2.1 Fogg Behaviour Model (FBM)

Professor Fogg of Stanford University has summarised a behaviour model that can be used in design. The Fogg behavior model proposes that the human behaviour is composed of three elements- motivation, ability, and trigger condition, and when all the three elements meet the corresponding conditions at the same time, the behaviour will eventually occur ^[2]. Simplifying this model to the equation, that is $B=MAT$, is shown in Figure 1, where B is Behaviour, M is Motivation, A is Ability, T is Triggers, and Triggers refer to the inducing factors that promotes the behaviours. The predisposing factors are divided into three types: inspiration point, conditional trigger point and signal trigger point. Motivation refers to the motivational factors that drive people to make a behaviour change. Motivation includes three main categories- pleasure or pain, hope or fear, and social acceptance or rejection. Ability refers to the user's ability to act when facing a product, it contains these seven elements- money, time, mental expenditure, physical expenditure, social deviation (degree of deviation from social norms), repetition degree and simply degree in the context of behaviour. Fogg believes that there is a certain trade-off relationship between motivation and ability. When the trigger point exists and is effective, the users will make a certain evaluation of their own action ability and motivation. When the result of the trade-off between the both exceeds the activation threshold, the user will make the target behaviour.

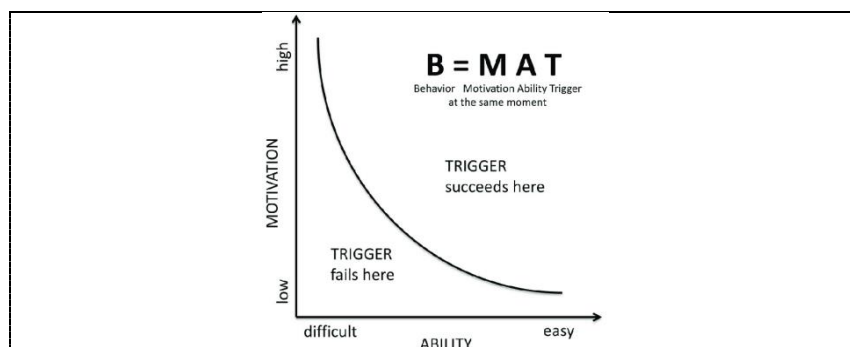


Figure 1. Fogg Behaviour Model.

Fogg believes that motivation changes as behaviour changes. Motivation varies from person to person. For designers, enhancing motivation is not a stable solution ^[2]. Oinas Kukkonen points out that the sign that the persuasion process is completed is when the user's attitude has changed, but changing existing attitudes is much more difficult than establishing or reinforcing them. Based on the cognitive consistency theory, persuasion through behaviour change is more effective than direct attitude change. Therefore, in this model, 'persuasion' mainly focuses on influencing and changing people's behaviour rather than their attitude.

2.2 Fogg Behaviour Grid

Based on the Behaviour model, Fogg further proposed the "Behaviour Grid", to distinguish the degree of behaviour change, as shown in Figure 2; the Fogg behaviour Grid was established in 2006. Fogg's conviction is to take the continuity of behaviour, as well as the promotion and suppression of behaviour as the standard, as it is basically possible to divide the behaviours that are involved in persuasive design into 15 types, each of which may require different persuasive design or persuasive techniques.

The behaviour changes are classified from the two dimensions of frequency and depth. The intensity of the target behaviour is represented by the horizontal axis, and the green, blue, purple, gray and black are used to represent the new behaviour, familiar behaviour, increase behaviour intensity, decrease behaviour intensity and stop existing behaviour. The vertical axis is classified according to the time logic of behaviours, including one time behaviour (Dot), period of time, behaviours with a certain duration (Span), and permanent behaviour changes (Path). The simple behaviours can be triggered by only one persuasion, while long-term behaviour changes require long-term persuasion to cultivate habits ^[3].



















	GREEN Do new behavior	BLUE Do familiar behavior	PURPLE Increase behavior intensity	GRAY Decrease behavior intensity	BLACK Stop existing behavior
 DOT One time	 GREEN DOT Do new behavior one time	 BLUE DOT Do familiar behavior one time	 PURPLE DOT Increase behavior one time	 GRAY DOT Decrease behavior one time	 BLACK DOT Stop behavior one time
 SPAN Period of time	 GREEN SPAN Do new behavior for a period of time	 BLUE SPAN Maintain behavior for a period of time	 PURPLE SPAN Increase behavior for a period of time	 GRAY SPAN Decrease behavior for a period of time	 BLACK SPAN Stop behavior for a period of time
 PATH From now on	 GREEN PATH Do new behavior from now on	 BLUE PATH Maintain behavior from now on	 PURPLE PATH Increase behavior from now on	 GRAY PATH Decrease behavior from now on	 BLACK PATH Stop behavior from now on

Figure 2. Fogg Behaviour Grid.

2.3 Persuasive Systems Design model

The Persuasive Systems Design (PSD) model is as shown in Figure 3. Having clear design goals and intentions are the main requirement of persuasion design, and the intentions come from the persuasion implementer, aiming at the changes in behaviour and attitudes that are caused by persuasion. From the perspective of the actual operation of persuasive design, the theory provides the design principles including the development steps of the persuasion system, evaluation methods, presentation of final product content, and the software functions ^[4].

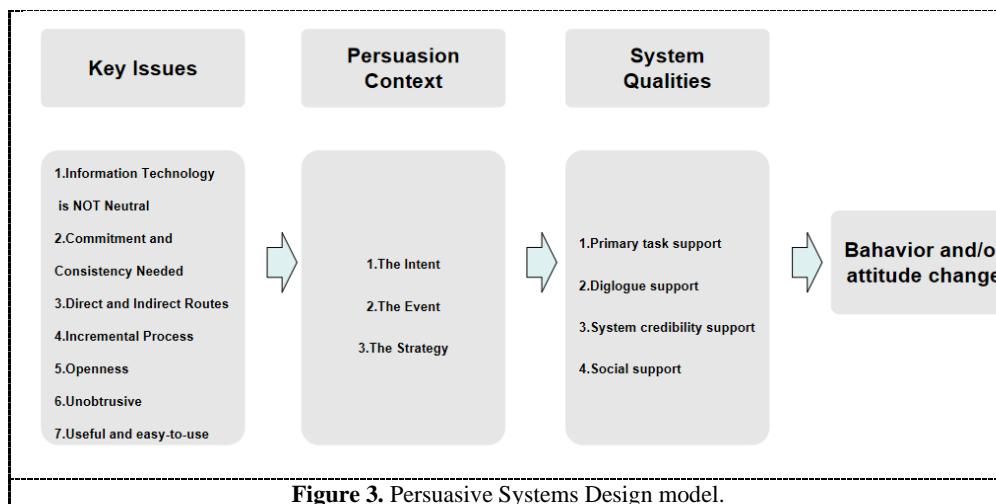


Figure 3. Persuasive Systems Design model.

3 Application of the persuasion design in smart wristband

In order to illustrate the application of persuasion design in healthy lifestyle products, through the application analysis of the above three models in the products, this paper takes the Xiaomi Smart Band 5 as the research object, in order to carry out the analysis of product persuasion design, that is how to change people's behaviour, so as to achieve the purpose of healthy Lifestyle.

Fitbit and Huawei have set off a craze for smart wristband, and major related companies have begun to join the ranks of developing smart wristband, it has caused conspicuous similarities in functions and appearances. However, Xiaomi has taken a different approach, and has launched an impressive product- the Xiaomi Smart Band 5.

Firstly, to analyse from the aspect of the 'ability' factor. We know from the Fogg Behaviour Model, these factors belong to 'ability': 'Time', 'Money', 'Physical Effort', 'Thought', 'Social Deviance' and 'Non-Routine'. A Fogg professor has also pointed out that relative to motivation, 'simplification' means to improve the users' ability to use the product, which can achieve a better persuasion effect. Therefore, the founders of Xiaomi have made use of convenience as a priority factor. They have found that the big pain point of today's wristbands is the frequent and troublesome charging, therefore, they adopt the magnetic attraction method, which avoids the disassembly charging method in the previous design. In addition, in order to be able to perform the real-time detection of the wearer's movement in various aspects, the Xiaomi Smart Band 5 has the monitoring records for up to 11 professional sport patterns, as well as the waterproof function. All of these features have greatly improved the convenience of using the wristband, which is to enhance the user's ability to use the product. In order to adapt to the current cashless habits of young people, Xiaomi band 5 has added the flash Payment function of UnionPay, which allows the users to directly wear the Xiaomi Smart Band 5 for payment, swipe your card for public transportation and entrance card control, as well as for remote control and to operate the smart home ^[5].

Then, to analyse from the aspect of the 'motivation' factor, the performance of the Xiaomi Band 5 in the 'motivation' factor is also quite outstanding. The breakthrough of Xiaomi 5 in appearance lies with the design of various young and fashionable colours (dynamic orange, vibrant yellow, deep space blue, lotus root powder, etcetera.), the theme of the APP adopts the popular two-dimensional theme elements (Hatsune Miku, Detective Conan, etc.), that is closely integrated with fashion. From this perspective, the attractiveness of the Mi band 5NFC in appearance enhances the motivation of the users to use it in different situations. In addition, in terms of social contact, the users can compete with their friends through products, and to motivate people to better maintain their health with the promotion effect that is brought on by social contact ^[6].

As for the 'trigger' factor, Xiaomi Band 5 encourages the users to be more active by giving medal rewards. Appropriate and timely guidance provides the timely help to the users, and uses periodic reminders to help the users to better maintain their behaviour. Through the combination of the above motivation, ability and trigger, it is in line with the B=MAT in the Fogg's Behaviour model, so as to achieve a change in the user behaviour itself. The author compares the product features of Xiaomi Band 5 with the persuasive factors in Professor Fogg's behaviour model, as shown in Table 1, and has concluded the secondary index as composed of the content of a healthy lifestyle (that is the Persuasion Context in the PSD model)- healthy diet, exercise, health responsibility, stress management, self-realisation and interpersonal support. The existing persuasive design cases are mainly for a healthy diet, physical activity, as well as the sleep-

related issues in stress management. We can also use different perspective and different persuasion methods to help the users to form a healthy lifestyle [7].

Table 1. Correspondence between the product characteristics and FBM

Persuasive Factors	Elements of Factors	Features of Xiaomi Band 5
Motivation	Pleasure	Fashionable appearance, Good quality and low price
	Social Acceptance	Healthy competition in the community
Ability	Time	Easy to operate, Long-lasting battery
	Physical Effort	Compact, Comfortable to wear, Nice waterproof performance
Triggers	Spark	Award medals
	Facilitator	Guide how to accomplish the goal
	Remind	Periodic reminder of goal completion

4 Persuasion strategies in the formation of healthy lifestyles

Through the analysis of the Fogg Behaviour Grid, it can be found that there are five stages in the formation process of a healthy lifestyle: motivation stage, preparation stage, action stage, regularity formation stage and part of life. Because the influencing factors of each stage are different, the persuasive design method and persuasive strategy will also change accordingly. In these five stages, the main function of persuasion design is in the first four stages. From the analysis of the influence factors in the fifth stage, in this phase, the user to the motive of behaviour has been transformed into intrinsic motivation, therefore the outside factors have less effect on the behaviour, but from another point of view, since the user has already formed the intrinsic motivation and turned this behaviour into a part of life, which means that the product to the user's persuasion has been successful, thus the necessity of this stage design intervention is smaller.

Still take the smart band as an example to analyse the persuasive strategy at each stage. Through the investigation and interview with similar products (smart band), the author comes to the persuasive strategy as shown in Table 2:

Table 2. The persuasive strategies for persuasive design at each stage

Stage	Persuasive Strategies	User Description
Motivation	Convey knowledge	It can tell me which things are high in calories and which ones are low, and tell me what to pay attention to?
	Condition assessment	Through the test, I found that I have obesity. The BMI measured at that time was high, so I wanted to adjust it to normal.
	The principle to persuade	I feel that the sleep quality analysis is not credible; it is based on your heartbeat and pulse flat rate through professional analysis

	Model inducement	Others can lose weight successfully, so can I; the official website says that tens of thousands of people use their products to lose weight successfully
Preparation	Planning action	The annual card cycle is too long, lacks of planning and tasks; it tells me what to do on Monday and what to do on Tuesday, like this
	Target quantification	It will give me tasks every day; according to the software, I found that my diet was unhealthy before
Action	Remind timely	Tell yourself when to exercise; sedentary will remind you every half an hour
	Simplify the behaviour	No input, only selection, which is very convenient; long standby time and convenient charging
	Enhance interestingness	The prompt patterns and charts in the APP are more interesting
	Feedback timely	Every time I complete the goal, there will be a nice reward page; after my accumulated points reach a certain value, there will be a badge reward
Regularity formation	Periodic reminder	Automatically report the previous day's data every morning; inspiring pictures and words; remind you to retest your physical fitness every month
	Adjust the target	This stage I need to know how to keep better diet.
	Virtuous experience loop	LED background light looks good

5 Conclusion

Science and technology place people first. Based on the case analysis of Xiaomi Bracelet and the interviews that have been conducted with the people, this paper has determined the influencing factors in the formation of a healthy lifestyle and the corresponding persuasive design strategies, simultaneously, it also confirms that the Fogg Behaviour model has a certain degree of stability and credibility. This has certain reference significance in the theoretical and practical research that are related to healthy lifestyles. The products that are based on persuasive design can guide people to live an independent healthy life and to better experience the joys of life. This is the ultimate goal of design.

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