Simulation Design of Wearable Device Based on Intelligent Interaction Concept

Jun Yan a, Xiaoran Han
Wuhan Textile University, Wuhan, China

*yanjun@wtu.edu.cn

Abstract. The intelligent interactive concept as the center, on the basis of the problem of drinking water container, with dressing device of portable items as bottled water way to resolve the problem, through the market similar products from the aspects of capacity, material, carrying way investigation and study, analysis of intelligent interaction design in the application of high-end products embody the characteristics of humanization, intelligent, timeliness, and combine with products created by efficient and convenient. In addition, the feasibility of intelligent interaction in wearable devices with portable items is verified through their intelligence, humanization, timeliness and material requirements. On this basis, through the simulation of functions and forms in wearable devices that can carry items, the intelligentization, humanization and timeliness of the concept of intelligent interaction are analyzed and illustrated with examples.

Key words: Intelligent interaction; Human nature; Intelligent; Timeliness. Wearable devices that carry items.

1. Market background of intelligent interaction concept
With the development of science and technology, intelligent products have gradually occupied the market, intelligent products with its two features of intelligence and humanization, become the first choice of users when they choose goods. The intellectualization and humanization of intelligent products are conveyed through the interaction with users, and they are deeply loved by people for their convenient usage, complete functions and fast information circulation. Traditional human-computer interaction focuses on visual and auditory interaction, and its purpose in product design is mainly to maximize the use function of products. The concept of intelligent interaction basically covers visual interaction, auditory interaction, tactile interaction and virtual reality interaction. The way the product is designed determines the convenience of the process. The purpose of interaction design is to enable the product to achieve "usability goals" and "user experience goals". At the same time to meet the emotional needs of users, man-machine integration, more perfect the development of the product.

1.1. Research and analysis of similar products in the current market
In the current market, the capacity of bottled water containers is 500ml, 1500ml, 2000ml and 3000mL respectively, which can be divided into portable bottled water and daily commonly used bottled water. In terms of carrying mode, other capacities of drinking water except 500ml are inconvenient. There are two drawbacks. First, the handle of bottled water is relatively soft and thin. As the volume of drinking
water increases, so does the weight. Secondly, bottled water can also hit the leg in the carrying mode. As the user wobbles while walking, bottled water oscillates with the body and increases hand strangulation, both of which are found in most bottled water products. The traditional way of thinking is to improve the handle of bottled water. The shape of bottled water is improved to avoid the problem of bumping into legs by changing the shape. We should change the thinking mode, and ask whether the problem of "hand strangling" can be solved by designing a way to free hands when carrying items. Whether the function of drinking water can be expanded to not only solve the carrying mode of bottled water, but also solve the carrying mode of other items.

1.2. Preliminary research on portable equipment
In today's market, there is a big gap in smart products carrying small items, and most smart products carrying items are smart luggage carrying large items. In the process of carrying goods can only use the function of the body, pull, lift or back. In the process of solving problems, the concept of intelligent interaction is applied in the design of this product. With its convenient and fast use mode and complete functions, it meets the needs of users to carry items in daily life and promotes intelligent interaction products. The wearable devices circulating in the market have different design principles and different technologies according to different parts of wearables. The wearable device, which can carry items, integrates into People's Daily life, becomes the "cradle of mobile items" for users, and liberates users' hands.

2. Features of intelligent interaction concept in wearable devices that can carry items
Experience is an important part of human life. Intelligent interaction technology known for experience includes but not limited to behavioral interaction and sensory interaction. Nowadays, numerous electronic contact products in the market have proved people's love for interactive experiential products, which pay more attention to users' participation and emotional satisfaction in the process of using products. In the process of using intelligent interactive products, users experience the fun of human-computer interaction, which depends on the intelligence, humanization and timeliness of intelligent interaction.

2.1. Intelligent
In the concept of interactive intelligence, intelligence refers to the attributes of an object that meet people's various needs with the support of big data, Internet of Things and artificial intelligence. In the way of carrying bottled water, intelligence is reflected in more efficient, more convenient and more comfortable way to complete the function of the product itself. Intelligence is reflected in man-machine interaction. There are many ways for products to complete user instructions. Products have their own intelligent system, and users can realize the transformation of product functions through actions or sounds in the process of using products. This kind of functional transformation will be faster and more convenient than the traditional way.

2.2. Humanized
Humanization refers to a caring concept, which is embodied in the convenience of consumers according to users' living habits and operating habits. It can not only satisfy users' functional appeals, but also satisfy users' psychological needs. In the design of wearable devices that can carry items in bottled water, wearable devices have close contact with human body and apply ergonomics to reduce the burden of carrying items in the most suitable way for human body. At the same time, wearable devices that can carry items will be transferred by people's will, and will change functions according to users' instructions. Wearable devices that can carry items have the function of memory, including the classification memory of items carried and the user's memory of instructions for different items. The user selects the memory mode, and the wearable device that can carry items makes automatic changes according to the previous instructions of the user.
2.3. **Timeliness**

Timeliness refers to the time difference between an object or information and the outside world in the process of communication, and this difference is timeliness. Timeliness affects the effectiveness of decisions and the time of information flow, and it can be said that timeliness determines the effectiveness of decisions within those times. The carrying mode of bottled water mainly refers to the timeliness of the user's instructions to the product. When the user gives an instruction, the product will respond accordingly. Generally speaking, voice is the most time-sensitive. Users only need to give instructions to the product through language, and the product will respond accordingly. In between, there will be the time for the product to digest the instructions.

3. **Feasibility of intelligent interaction in wearable devices that can carry items**

As the product of intelligent interaction technology, ordinary materials can no longer meet the functions and requirements of intelligent interaction technology, so we should turn our attention to intelligent materials. Intelligent materials are the fourth generation of materials after natural materials, synthetic polymer materials and artificially designed materials. They are one of the important directions for the development of high-tech new materials.

The way of carrying drinking water containers mentioned above can break through the traditional way of combining human functions and appear in a wearable way. For example, the back of a carrying item is the back, so the wearable device can be designed as a "backpack", but not limited to such a form. Combined with the knowledge of ergonomics, the shape of the line that fits the back of the human body is the most lightening burden, and it will hold up the weight of items without damaging the body. The functions of arms and hands support most activities of the human body. The combination of wearable devices carrying items with arms and hands should consider the functional status of arms and hands. The elbow is a turning point between the upper arm and the lower arm. It is also a key point of weight. You can use the elbow node to reduce the burden of carrying things. The function of the control device can be designed by placing it on the part of the finger, adding sensors of the finger, completing the functional changes through the flexible control of the finger, and adding sensing nodes to the position of the knuckle. In this way, the functional requirements can be transformed through gestures. Find the most suitable parts, and design wearable devices with complete functions, light shapes and suitable for human body functional structure according to their characteristics.

The concept of intelligent interaction is applied in wearable devices that can carry items, and the timeliness is also a key factor to evaluate a product. The ancient Chinese philosopher once said, "To the body, to the heart". The body and the mind are the key to experience. If a product satisfies the user's emotional experience and sense of participation, it needs to quickly make corresponding functional changes to the user's instructions, so as not to produce unpleasant feelings due to the poor timeliness of the product. The user's satisfaction with the product is also conveyed partly by the timeliness. If a product changes too slowly in the function, it will affect the subsequent function use. Timeliness is strong, which is related to the time needed for the product to receive signals, the time needed for intelligent calculation through the intelligent system and the time needed for the product to make responses, which is the combination of the three. If one part fails to complete the functional transformation in the prescribed time, the product will delay the use of subsequent functions, which in turn will create a cycle of satisfaction with the use of the product and so on.

4. **Conclusion**

Since Bill Moggridge put forward the concept of interaction design in 1990, the concept of intelligent interaction design has been concerned and explored by people. The experience users feel in the process of using intelligent products is caused by two-way communication and interaction between people and products. It has emotional components that ordinary products do not have, which is also the unique characteristic of intelligent interaction concept. The development of science and technology promotes the higher efficiency of products. Products serve people and meet people's growing material and cultural needs. Humanization and intelligence are still the driving force of product development today.
Nowadays, the concept of intelligent interaction has been increasingly integrated into daily products, from machinery and equipment for production, cars and houses, to kitchen utensils, water cups and other small products, gradually integrated into the concept of intelligent interaction, and appeared in people's lives in a more efficient and convenient state. Perhaps, the concept of intelligent interaction is the soul of future product design, and the innovation and function improvement of each product cannot be separated from the concept of only interaction. Similarly, designers should also keep pace with the pace of science and technology, keep pace with The Times, innovate more and more efficient products, and create products conducive to people's better life.

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