Interface Design of Handheld Mobile Devices for the Older Users

Wu Qian [1] [+] , Wang WenDao[2]

[1]Langfang Normal University Academy of Art

[2] North Chian Institute Of Aerospace Engineering,

Abstract. The using handheld mobile device is increasing constantly in the elderly population proportion in China, in the digital virtual environment, as a kind of intermediary,the interface is utilized to realize the interaction between user and computer.The paper discusses and analysises the interface design of the handheld mobile device which is suitable for the elderly physiological characteristics from the icon interface design and color design,improve interpersonal communication smoothly and effectively and it has a certain reference value for the elderly using of handheld mobile device interface design.

Keywords: The older users, Handhedl mobile devices, Interface design

1. Introduction

Handheld mobile devices can be defined in a broad concept that the product can be used with one hand or both hands, not limited in the weight of equipment, energy and other factors, can be moved during making the normal operation. Narrow concept refers to pocket-sized computing devices, usually have a small display screen, touch input, or a small keyboard. With data storage capability, can be secondary development, a graphical man-machine interface, a display and input capabilities, with other equipment for data communications, can rely on an independent power supply to maintain operation[1].

Through handheld mobile devices, you can get all kinds of information at anywhere and on anytime, this type of equipment play an increasingly important role at the transmission of information in modern society, work and entertainment. Currently the common handheld mobile devices on the market are mobile phones, intelligent design, PDA, MP4, GPS navigation and so on.

China has entered the aging society, according to census data of 2000. At the end of 2000, China will have about 130 million old people at the age of 60 and older, accounting for 10.46% of the total population, 88270000 old people at the age of 65 and older accounting for 7.10% of the total population. The ratio of young and old is 45.68%, the median age was 30.8 years old. Thus, from the twenty-first century China had entered the aging society.

With the constant development of China's economy, the income that can be controlled by old people to increase ceaselessly. Older people on the pursuit of quality of life also exist for great demand of handheld mobile devices, but now the handheld mobile devices designed for old people on the market is very rare, it is a great contradiction between this kind of condition and the increasing demand.

According to the results of interrelated research, the core vales that encourage the consumption of the elderly includes: Independent (The older consumers want to own self-sufficient life); Keep in touch with the community (The older consumers are serious about their relationships with family members); Altruistic attitude (The older consumers want to pay for social and family continuously)[2]. According to the physical

---

characteristics of elderly, the main research target of this thesis is defined as the healthy aging consumer between 60 to 70 years old, can take care of themselves, with the ability to judge the choice of goods.

The old consumer groups have stable and rational consumption habits. The quality, price, utility and brand value of the product is the primary factors that affect their shopping. First, they hope the interface design of the handheld mobile devices could be operated simply. Second, the main menu and submenu of the interface should be clear and easy to enter.

The following analysis the visual design elements of hand-held mobile devices that suitable for physiological characteristics of the elderly from the icon design and color design of the interface.

Interface Icon Design of the hand-held mobile devices.

With the ever-changing media carrier, there are more and more innovative, creative and stylish icons our daily life. From the information can be transmitted quickly and accurately to the target point of view. As the most important information carrier of interface design, the icon design is not just a symbol; it plays an important role on the information transfer. Today, icon design has become a specialized field of vision research. Due to the elderly their own physical characteristics, they should focus on the easy identification of icons.

2. Handheld mobile device's icon design should be as direct, simple and unique as possible.

Some research show that compared with the text interface, icon interface does not reflect the obvious advantages on the transmission of information Most people even think that the icon must be combined with text, icons is just a form of beautification. The main reason is that the relationship between transmission of information and the text is direct, but the icon may be able to express directly and clearly. Especially a complex icon may cause misunderstandings by customers and induce the error directly. Therefore, the icons design of handheld mobile devices for the elderly need to focus on the following aspects:

- Icon in the interface design should be balanced and stable, giving somebody the perception of balanced and orderly. Composition form of interface contains level of composition, grid-based composition, well shaped composition, cellular-type composition, circular composition, S-type composition and so on.

The elderly vision and operation ability are worse than the young, so complicated icon form will affect the operation speed, and they will feel bored and frustrated. Stability of equilibrium level and square composition are in line with their reading and operating habits. From this form, they can find the operation way of their demand. The change of the icon should be balanced and ordered, and avoid complication.

- Icons should be similar to the shape of system commands, and system commands must use different icons.

Icons should avoid excessive abstract, if the icon can not express the target system instructions clearly enough, you can give a text label at the bottom of the icon, in order to clarify its meaning, to avoid the elderly guessing secondly actuating identifying icons quickly and accurately.

- In order to avoid the elderly misunderstandings, we should use rational moral icon, and avoid using the current pop culture icon.

For example, "囧 culture" is very popular among the young people, but it is very strange to the old, so it is difficult for the old to get access to such information. We can add some visual image to the icon design, such as house represents address; telephone represents contact way, letter represents mailbox, two connecting globes represent network connection, and red heart represents favorite folder, and these implied icons are easy to understand after adding some letters.

- Icon design must clearly distinguish from background, allowing older users to easily understand.

We can set a clear boundary contour beside the icon, so that the older users can distinguish icon object. At the same time, we can also magnify the icon size and the gap among the icons. A experiment was proved by Breed , in a single hand operation, icon should be magnified by about 30%, single finger about continuous operation should be bigger than 5 MM , mobile devices for the elderly should be more than 8 MM icon spacing, the distance is more suitable for the eyesight of the elderly to see icons clearly.

3. Designing the icon color of handled mobile device

People accept information from outside world about 90% come from eyes, so color have great influence on emotional preference. The famous "7 seconds" has proved when people see different kinds of commodity; they need only 7 seconds to determine the goods which they are interested in, so the color plays an important factor which accounted for 70%[3]. Therefore, designing the interface color of a suitable mobile device for the old is very important.

- Icon color design can not use more than 5 kinds of colors.

Handled mobile device interface design differs from the planar design or commodity display design; it should not only satisfy the user's aesthetic needs, but also play instruction role of information. The research from the function point of view shows that graphic interface design should not be more than 5 kinds of colors, therefore those over fifty may have trouble to obtain the information, and can have visual fatigue.

- We can choose gray, in order to build a concise, plain and simple visual effect.

Survey and studies showed that 63% of the over fifty group, prefer peaceful and calm visual colors, if in a calm colors with small amounts of high saturation, and bouncing color, it will become their favorite choice. The choice of colors can be used on different lightness, such as black, white and grey, with low saturation and high purity of the green, yellow, blue or red can give the elderly users comfort and a sense of fluency, while the low saturation and high purity of color ensure the elderly users' long time viewing without visual fatigue. High purity of red, yellow, blue, or green not only has the elegant style and fresh colors, but also avoids the dull interface color.

- According to the menu interface, using different brightness of the same color, according to different functions and different color, reflecting the sense of rhythm, forming the color guide.

Handled mobile device operating system from the main menu to the sub-menu has different task instructions, in the color design, according to the different menu, we can use different brightness of the same color, from the background to the top menu, color brightness according to 3% in increasing order can have vision of progressive effect, and give users proper visual effect. Each main menu uses a different color, and distinguishes from the background color; the submenu with different brightness in order to have distinct interface and clear guidance.

- According to the strength of light, designing two sets of free switching interface icon color system.

Handled mobile device can both work indoor and outdoors and indoors. The background with black gray can add blue red yellow with the soft light indoor. Font can choose low luminance of the white color system, which is easy to recognize the font without visual fatigue. The former color system with strong light environment is difficult for ordinary users to recognize, not mention to the elderly. Because of the strong light, we can design white background with blue, red and high saturation and high brightness color, and interface text can be used black, so it is easy to acquire information.

4. Designing letters of handled mobile device

There is a close relation between letter size and LCD resolution. For example, the best resolution of 17 inch is 1280*1024. Compared with 14 inch LCD, the letters with same Pixel which height and width is reduced by 95%. 5% is a low rate，if we use 15 inch LCD which resolution is 1024*768, the letter size will reduce 16%, and the letter size will reduce 24%, if we use 17 inch LCD. Therefore we are unable to recognize the letters on the big LCD. For the older, the letter size must should be bigger than the general letters in 5%, in order to meet the demands of older people to read.

Handled mobile device of Chinese characters font selection is Arial, which Arial strokes structure is slender. Font is easy to cause stroke loss on the LCD. Therefore, we should increase letters size, and space apart 2MM between letters, so that the elderly can capture interface information easily.

5. Reference

[1] http://baike.baidu.com/view/5306882.html?wtp=tt

[2] http://hi.baidu.com/ucdued/blog/item/9f5bdld5blfdb4cd50dab28.html

[3] http://baike.baidu.com/view/1263244.html?wtp=tt

[4] Dong shihai; Wang Jian; Dai Guozhong, et al .Human-computer interaction and multimodal user interface[M]. Beijing: Science Press,1999 (in Chinese)

[5] Chamom-Koc M; Popovic V ; Emmison M Human experience and product usability : principles tu assist the design of user-product interactions 2009(04).