

How to Make the Computer More Friendly --Talks on HMI Design

Xiangli Li

Nanyang Vocational College of Agriculture, He Nan, Nanyang, 473003, China.

Abstract

By introducing the basic knowledge of human-computer interaction and analyzing the characteristics of interface, this paper focuses on the main modeling problems and personnel coordination problems to be solved in computer interface design, such as role model, target model, work model and other key problems, so as to provide important ideas for the design of friendly human-computer interaction interface.

Keywords

Computer; Human-machine Interface.

1. Introduction

Computer has become an indispensable tool in modern society. However, there are still many people who are not used to using computers, feel difficult to learn and use, and have a sense of fear of computer. How can you make the computer more friendly? We believe that it can be achieved by improving the human-machine interface.

In China's software industry, many of our peers do not pay enough attention to interface design, and many software engineers believe that as long as the visual interface implementation can meet the functional requirements proposed by users. In fact, most of our end users are non-computer professionals, who are not very proficient in computers and do not very know exactly what computers can do in their work. Often can only put forward the basic requirements, for what is a better interface understanding is fuzzy, can improve the interface, and the difficulty of improving the interface are unknown. So there are many beginners who feel difficult to learn and use, and even some factory computers are only used for typing! Computers in the home are mainly used as playing VCD and playing games.

In our country, many software engineers do not have enough knowledge of human-computer interaction. In the analysis stage, most stay in the user interface should include which Windows, no sliding bars, what control keys, etc. In many cases, let the user decide on the interface style. We must be clear that the end user is not an interface design expert. It is difficult for ordinary users to propose suggestions on the structural improvement of the entire system interface. For example. People who have no painting experience think that Mr. Xu Beihong's horse painted is very spirit and high temperament. If you have no painting experience and let you propose to modify a student who has studied painting for several years, I am afraid you are a little powerless.

2. Basic knowledge and interface characteristics of human-computer interaction

The key to making the HMI friendly is a deep understanding of the user's characteristics and goals. Generally, the target tasks of users can be divided into two categories: daily affairs classes and problem-solving classes. Daily affairs class: there are generally some special process characteristics, with events to drive the whole operation process, a short cycle, the simple transfer and reasoning of the input data information. When handling daily affairs, the computer prompt should be concise, and the system should react quickly. Problem solving: different needs and objectives, such as preparation procedures.

When dealing with this problem, the prompt should be as detailed as possible and have high system reliability.

The interface classification of human-computer system conversations can be based on two factors: whether the human-computer conversation is guided by the computer system or by the user. Whether the ② user selects from a list, such as a chapter, or enters it independently.

The human-machine interface can be divided into 4 categories: system guidance / user selection, it is particularly suitable for the daily routine work, it increases the speed,

Received date: 2000-07-18

Author introduction: Chai Jolin (1956-), male, associate professor, mainly studying computer network application. Chen Cheng(1968-), male, master, mainly studying network software, etc.

And reduces possible input errors. ② system boot / user independent input, this type is usually suitable for collecting classified information. g. when visiting audience life goals are. ③ user guidance / user selection, this type is more suitable for users to have a certain understanding of the system, know what requirements can be put forward on the system, or when the independent input is some inconvenient, it can be used to configure the system. ④ user boot / user autonomous input, a type that is suitable for experienced users, has the lowest structured features, maximum flexibility and most difficult to navigate.

A complete system interface may include several types of the above class 4 classes. But no matter what type, in addition to the function, performance to meet the requirements of users, should also have a certain beauty, such as the overall harmonious interface and change. The interface is too unified, plain as water: change too big, is easy to cause unfamiliar feelings and boredom.

3. Model establishment of human-machine interface design

A friendly interface enables end users to focus on their work to do without consuming effort to operate the interface, so model building is critical. The following model, combined with the characteristics of the user, makes full use of the basic theoretical knowledge of human and machine, object-oriented programming methods, the prototype methods of software engineering and other related knowledge.

The establishment of friendly interface model can be divided into three main steps: role model; target model; and working model will be discussed below.

3.1 Establishment of the role model

Role models include important features of users Generally, it is difficult to model each user, but by introducing "roles", important features of different users can be integrated into them. We can use each role to represent a class of users. Generally, it is difficult to represent all the users with a role

To distinguish each character, give each character an appropriate name and then add an appropriate description. The description of each role should generally include the following: age (old, middle, young, less), job level, familiarity with computer application, frequency of the computer and length of the week, education, preference for color, etc.

3.2 Establishment of the target model

The target model is a list of priorities for tasks to complete, each job has its own goals, work objectives include multiple aspects, and different priorities for each aspect. Designing a user interface is to choose in different design schemes, such as knowing the most important task of the user, which will make this choice easier.

To determine the most important tasks of each role, we can assign a priority series for each task of the role, generally choose 2-3 tasks with the highest priority level, and the user interface should enable the user to easily.

However, the task priorities of the various roles may potentially conflict seriously, when the total time of the computer and the importance of the role can be used as the judgment criterion to determine which task is the most important task.

3.3 Working model establishment

The working model is the description of the user's work and the required information and operation.

Set: A workset is the sum of tasks associated by a series without sequential requirements by a role. Each employee within an organization is always responsible for certain affairs, and the duties are here described here as a work set, such as the duties of the salesman may be described as a set of work consisting of sales and checkout. The tasks within the salesman workset are of the daily transaction type.

Interest objects and methods: the working set of each role is closely related to information, when designing the interface, always keep in mind that enables the user to easily use the required information. The user's requirements for information and the desired functions can be defined as the information objects and methods. In order to ensure that the information requested by the user is not missed, the information objects and methods should be described in the working terms of the user, rather than in computer terms. If the bank accounting deals with accounts and credit cards, rather than forms and roll bars, etc.

To define information objects, a relatively complete data model is required, defining each instance within the workset as several information objects with inheritance and association relationships between information objects.

The functionality of information processing requires it to be described by methods of taskset instances associated with information objects.

Number of Properties and Actions of the Image: In object-oriented programming methods, the class model defines the attributes and methods of each class, but some of the attributes associated with interface design are not fully described in the data model in order to design user-satisfactory bounds

The face shall be described in detail.

We know that sometimes users need to observe the same information from different aspects at the same time, and therefore, when designing the interface, the information objects involved in completing a certain task should be made clear.

We know that the computer screen space is limited, such as conditional permit, can show all the relevant information of a task instance in one window, but in some cases it is difficult to do, to facilitate the user, the attribute should also give priority values. Display the attributes with higher weights in the first window, the secondary attributes in the second window, and the fonts, colors and others for some particularly important attributes.

To reduce user input, some attributes can use the default properties, and some attributes need to display thresholds to distinguish between different states. If the temperature of certain materials in production exceeds a certain value, it will be normal within the appropriate range, otherwise it is abnormal. If such relevant information is displayed, it will be greatly convenient for the user. It is also important to understand the operation characteristics of information objects. If you can know what operations users use often, you can arrange shortcut keys for such operations, which can save user operation time and make the interface more friendly.

4. Coordinate with the relevant personnel

Users, interface designers and software engineers play different roles in interface design, interface designers are a bridge between users and software engineers and should be responsible for coordinating the relationship between the three people. Only in this way can the type of human-computer dialogue be determined and a friendly interface 0 be designed

Users are proficient in their own industry, and the interface designers should have more contact with the users. It is best to understand the task characteristics and the users' psychological characteristics, which is more conducive to grasping the key points and being reflected in the interface design with artistic methods.

Software engineers are the ultimate implementers of human-computer interface, mostly have rich programming experience, but often lack communication with users, lack experience in interface design and artistic knowledge. Interface designers shall communicate with software engineers to ensure overall friendliness of the interface.

References

- [1] Ben Shneiderman. Multimedia User Interface Design- -Effective Human-Computer Dialogue Strategy [M], Shanghai Science Popularization Press [1995.10-120]
- [2] Lance A. Diller and John C. Thomas. Behavioral Issues in the Use of Interactive Systems [J]. International Journal of Human-Computer Studies, 51 (2): 169-176.
- [3] Zhao Jiangong. Design psychology [M]. Beijing: Beijing University of Technology Press, 2004.