

# Mobile Phone UI Design Principles in the Design of Human-machine Interaction Design

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**Abstract**—This paper based on the principle of mobile UI design, expounds that only little input on beautiful and easily use of design, it will have great output. In conclusion, based on the control of mobile phone's interface design standardization, can achieve very good people and interaction effect, the experience of mobile phone users are more higher satisfaction to the complementary products will have greatly increase value.

**Keywords**- UI design; Interaction Design; Mobile Theme

## I. INTRODUCTION

The UI is short for User Interface. User interface refers to the composition of the system of people and products, people and products to complete transfer and exchange of information between the working face[1].The UI design criterion refers to software human-machine interaction, operation of the logic, interface aesthetics design. Mobile phones have become essential to our daily life, but also have a large part of the phone while the simple functional meet. The user experience feelings remain in the most simple graphics and animation basis. Just hold the design principle of the mobile phone UI design, which will have great development space for mobile phone software, has become a taste, also let software operating become comfortable, simple and free software, fully embodies the characteristics and position, and finally to provide users with gratifying experiences, man-machine interactive effects of harmonious.

Nowadays with the rapid development of computer hardware, the past software already can't adapt to the requirements of the customers. Software products in the fierce market competition, there is only powerful function is far from enough, enough to win strong rivals. Fortunately, some forward-looking companies have started to realize the UI to bring huge selling software products, Such as apple launched iphone depending on its unique design of mobile phone application advantages, rich and new user experience will phone into a smart, application and efficient era, etc.

## II. THE STATUS OF DOMESTIC AND OVERSEAS MOBILE PHONE UI DESIGN

Interface design of software development in long, interface design work has never been seriously rise. The people who do interface design are called "art" derogatory. Actually the software interface design for industrial products like the industrial design, modeling is important to buy

products. A friendly beautiful interface can give a person with comfortable vision enjoyment; close the distance, a man and a computer to create business. Interface design is not only the art, he needs to locate users, use environment, use and for end users and design, it is pure science of art design. Test an interface standards is neither a project team leadership opinion is not project members vote, but the end user experience. So the user interface design and combining research, is a continuous designed for end users satisfactory visual effect.

Many businessmen think the core of software products is technology, and is only minor UI; the proportion of personnel in the treatment can be displayed with. But this is not true value UI design, just a necessary UI design development process. Our products with mobile phone industry, for example, when the phone is just coming into the market not only expensive, but nothing other than except calls. Because of the leading technology, so everyone focused on standby time signal, etc, and life for product modeling, the rationality of the use of less concerned. Now, technology has changed completely to users, and merchants to create, for improving, attaches great importance to the appearance of the product design, besides also frequently labeled, and launch SMS, MMS, chord, camera, etc. So the beautiful, personality, product easy to learn, and became humanized selling products, etc. Software products and product development are the same. Because of the limits of computer hardware past, encoding become the pronoun of software design, beautiful affinity graphical interface and reasonable use of interactions are not sufficiently, actually this period of software is software program, instead of software products.

At present domestic universities and colleges hasn't set relatively perfect UI design professional, so improving UI designers key lies in the ability to provide a good study and exchange of resource environment. There must be an information-quickly and abundant resources, the design level of first-class professional authority, the UI design study and communication can adapt to the place of the UI designers demand.

Nearly two years the mobile phones UI part can be divided into three categories:

The top design: Representative product is iphone.



Figure1. iphone UI decomposition display part



Figure2. one piano software of iPhone app store

Common design: Representative product is NOKIA.

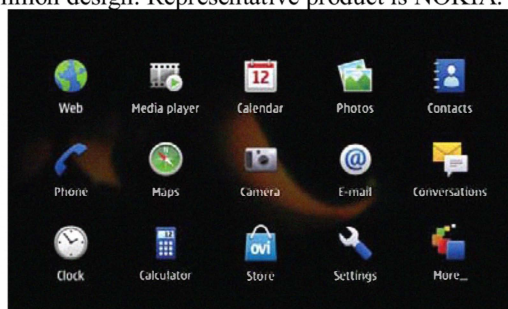


Figure3. NOKIA's menu interface

Low design: Representative products are pirate mobile.



Figure4. part user interface of pirate mobile

New explore:



Figure5. Three-dimensional display effect



Figure6. Menu animation form a breakthrough

### III. TECHNOLOGICAL PROCESS

#### A. Confirm target customer

The UI design process, the demand of the software design characters will determine target users, for end users and direct the needs of users. The user interaction should consider different target user interaction design emphasis of the different. For example, users must be designed for the elderly, and some font is designed for youth and vigor, some men to design of partial white-collar modern, mature, atmospheric some etc.

#### B. Acquisition targets the habit of user interaction

Different types of target user interaction with different customs. This habit of interactive way often comes from its original in reality interactive process, existing software tools of interactive processes. Of course on the basis of investigation and analysis we have to find customers through the interactive effect to confirm to flow, and down. For example, young people to cool the interaction effects, and some great age to simplify the animation and so on.

#### C. Prompt and guide the user

Software is the user's tools. So by users should come operation and control software. Software responds to user action and set of rules.

For the user interaction results and feedback, prompt the user feedback, and guide the user needs of users in the next operation

#### D. Follow the consistency

##### 1) feed Consistency of Design goal

Software component, there are several different parts of interaction between design goal requires conformity.

Example: if the use of mobile phones as a primary target users user operation, to simplify the interface design goal, logic to implement the objectives, rather than localized software.

##### 2) Consistency of appearance element

Interactive element is the appearance of the user interaction effect. The same (class) software adopts agreed to maintain the style of appearance, user interaction effect, have very great help to improve. Unfortunately, how to confirm the same look elements have no special unified measure. Therefore need to obtain feedback investigation target customers.

##### 3) Consistency interactive behavior

In the interactive model, different types of elements of the corresponding user triggers actions, after the event takes interactive. For example: all the user needs to confirm the dialog operation and abandon all include at least two buttons.

For interactive behavior principle of consistency of extreme idea is the same type of interactive elements caused by the same behavior events. But we can see this idea although, in most cases, but is not contrary examples of this concept design, can according to simplify user operation process.

#### E. Follow the usability

##### 1) ify user operation process. Can understand

Software for users, the user must be understandable software elements corresponding function.

If the user can't understand, so need to provide a non destructive ways, allows the user to the operation of the element by its corresponding function. For example: delete operation elements. Users can click the delete button that prompts the user operation to remove operations, or whether to confirm delete operation, the user can more detailed understanding of this element, and at the same time can cancel this operation.



Figure3. the 12 icons in The graph of the lower are less recognizability than the other three

##### 2) Can achieve

Users are interactive centre, interactive elements corresponding user needs to function. Therefore interactive elements can be controlled by the user.

Users can use such as a keyboard, mouse, interactive devices via mobile and trigger existing interactive element to other before this invisible or not interactive elements.

Note the frequency is interactive will affect the effect can be achieved. When a function was deeply hidden (generally more than 4) so users reached the element of risk are greatly reduced.

The effects can be achieved with interface design. Too complex interface will influence the effect can be achieved.

##### 3) Can control

Software interaction, the user can control process.

The executive function, the user can flow control.

If you do not provide control is used for target users understand hint user.

### IV. PRINCIPLE

From the psychological to points, interface design can be divided into feeling (visual, auditory and tactile etc) and emotional two levels. User interface design is an important part of the screen products. Interface design is a complex engineering which have different disciplines in, cognitive psychology, design, linguistics, etc in this play an important role. There are three principles of User interface design: the user interface to under control, Reduce the burden of user

memory, maintain the consistency of the interface. The user interface is between man and machine communication, communication. From the depth of feeling can be divided into two levels: and emotion. Feeling level between man and machine refers to the visual, auditory aspect; touch, Emotional level refers to communicate between man and machine because of a harmonious relationship. In the user interface design based on the artificial center, make the products to use simple pleasures and use of design.

User interface design flow into the structure design, interaction design, and visual design of three parts in the work.

#### A. Structure Design

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable. Structure Design also called Conceptual Design. It's the frame of interface Design. Through the research and analysis of user tasks, formulate the overall structure of products. Based on the Prototype of the Paper's Prototype can provide the user testing and perfect. In the structural design of the system, the logic is defined and words users easy to understand and operation of important premise. If the Siemens mobile set alarm entry is "memorabilia", let users can be difficult to find. The integrity of the interfacial effect consistency, mobile phone software running on the operating system software environment, the design of the interface should be based on the application of the integral style of the platform, which is conducive to the integration of product appearance.

##### 1) Interface with the color and style is unified interface system

The general color should close software and system interface, for example: the overall and tonal, tonal give priority to with blue system of our software by default color, if the best dovetail with different colors and use, such as red, citric yellow, the color of intense changes will affect the use of user, you bought a fake from appearance to system interface were satisfied with the phone, when suddenly found the operation of the application software and system with unified interface, you will feel? The first thing we feel bad the user will also go to use it? So we need to know the appearance and system interface mobile phone manufacturers have is according to user's aesthetic habit custom, it should have their aesthetic group, we should give this phone software should make effective use of the mobile phone manufacturer based on the aesthetic characteristics, in order to win like this, make them mobile phone user interface of system and efficient transfer of the affirmation to our products. Certainly reasonable combination system interface design including ICONS, button style in different operating conditions and the visual effects.

##### 2) Unique interface framework

Software utility is the fundamental software applications, our software applications should be designed to combine the scope of reasonable arrangement layout, in order to achieve the objective of beauty for This is not necessarily consistent

with the system up to standard, it should have it with industry standards, such as: securities trading, map manipulation interface characteristics need to analyze the characteristics of software applications and process development of relatively standardized interface architecture. Operating area of the interface framework features, content display, navigation control area should be unified and standardized operation of different functional modules of the same elements of the region should be consistent style, so different users to quickly master the operation of the module. Thus the entire interface is unified into a unique whole.

#### B. Interactive Design

Interaction design aims to make the products so that users can simply use. The realization of any product features are man and machine interaction through to completion. Therefore, the human factor should be the core of the design is embodied.

Systematic operation process. Operation of mobile phone users habits are based on the system, and we in the interface design process in the operation of the arrangements, have to conformity with the norms Xing, allowing users to Ke Yi Shou Ji will use our software, simplify user operation flow.

Natural harmony of intelligent human-machine interface, communication features include: (1) natural communication: to see, hear, talk, to touch; (2) active communication: there is expected, will ask questions, and timely adjustments; (3) effective communication: emotional changes of the sensitive, understanding the user's emotions and intentions.[2]

#### C. Visual Design

In the structural design based on the reference target groups reached the psychological model and the task for visual design. Including colors, fonts, page and so on. Pleasing visual design used to achieve the purpose of the user. Coherent interface. Interface buttons such as mobile phones emissions, certainly left; right negative; or the content displayed by. Color and content. Overall the software is not more than five colors, minimize the use of red, green. Aesthetics and the principles of coordination.

Interface should be the size for aesthetic point of view, feel comfortable and coordination, can be effective to attract the user's attention within. Font size proportional to the size of the coordination and interface, foreground and background color with reasonable coordination, contrast should not be too great, the best use of dark colors, such as red, green and so big. If you use other colors, the main color to soft, has affinity with the magnetic force, resolutely put an end to the glaring colors.

##### 1) Dedicated interface icons

Software icon button is based on their application command set, which each graphic contents Map is a goal of action, so as the embodiment of target movement of the icon, it should have a strong expressional, production of the process of selection has the typical industry characteristics icons to help users identify, facilitate the operation. Icon graphics creation can not be too cumbersome to adapt to the

phone itself shows a small area of the screen, production as much as possible using the pixel map, to ensure a clear image quality, if for three-dimensional interface, can be considered part of the emergence of effective pixels to enhance icon the sense of depth.

#### 2) Interface color personalization

Color affect a person's mood, the color will be different people have different psychological effects, the contrary state of mind can accept different color is different, changing things can cause people's attention, interface design, color personalization, purpose is to coordinate with the color of the user's psychological transformation, Rang our software products Shichangbaochi one kind of new degrees, which is according to their needs by the user to change the default system settings, select a personalized their satisfaction configured to achieve software products and coordination between users. Among the many software products are related to the interface of the peeling technique, in the phone's software interface design process, the application of that personal settings can be more attractive to upgrade the software to meet the various needs of users! At the operational implementation of the process, the color match is very important to consider the icon colors and skins the color contrast and color effect of the unity, in order to not cause flowers, random effect of the interface.

#### 3) Graphic image quality elements

Best performance with less color depth colorful graphic images, both to ensure that the amount of data small and to ensure that the effect of graphic images intact, so that

graphic image in the software system to minimize the share of the amount of data to improve program efficiency.

#### 4) Line blocks of color and graphics combination of images

Interface lines and color blocks will later be achieved with procedures, which procedures need to be considered part and image part of the combination of a natural combination of UI effects can coordinate the overall sense, it requires the programmer and interface designer for close communication, agreement.

### V. CONCLUSION

Along with the continuous development of mobile phone functionality Yu of powerful software-based phone system came into being, mobile phone design is not limited to human nature has been the appearance of mobile hardware, mobile phone software systems have become the direct operation and application users subject, it should be beautiful and practical, convenient for the users favor. Specification of user interface design is particularly important.

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