User Interface Design Issues In HCI

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Summary

This paper presents an important analysis on a literature review which has the findings in design issues from the year 1999 to 2018. This study basically discusses about all the issues related to design and user interface, and also gives the solutions to make the designs or user interface more attractive and understandable. This study is the guideline to solve the main issues of user interface.

There is important to secure the system for modern applications. The use of internet is quickly growing from years. Because of this fast travelling lifestyle, where they lets the user to attach with systems from everywhere. When user is ignoring the functionalities in the system then the system is not secure but, in other systems there exist some threats can harm the system. For example: when the user is not educated or have no knowledge to use the device then such system is not secure for such user. This paper points judgmentally through an audit of existing writing, the significance of exchange off or adjust amongst convenience and the security of the framework. For all kind of items, the UI is checked or estimated by utilizing the heuristics assessment, intellectual walkthrough, formal ease of use review, pluralistic walkthrough, highlights examination, consistency investigation, standard review and numerous more techniques. The creator played out the study to look at the ease of use for all the current telephones. As the outcome for the simplicity of client, two models are discover, client fulfillment and learnability. The survey results that UI in view of proposed structure is easier to understand than the board based UI.

Key words:
Interface design issues, usability of user interface, data security issues.

1. Introduction

This article is about the human computer interaction and also about the user interface design issues in HCI. The main issue in the design is that the interface is not understandable for all the users, that's why when a person does not understands the interface then he is not able to use such software. The user interface means the user and the computer both can interact with each other. For example in using the input devices the computer and user both are attracted with each other. The main types of the user interface are as following:

- Command line
- Graphical user interface (GUI)

Command line is the interface that allows the user to interact with the computer by directly using the commands. But there is an issue that the commands cannot be changed, they are fixed and computer only understands the exact commands.

Graphical user interface is the interface that allows the user to interact with the system, because this is user friendly and easy to use. This includes the graphics, pictures and also attractive for all type of users. The command line is black and white interface. This interface is also known as WIMPS because it uses windows, icons, menus, pointers.

Menu-driven interfaces are the interfaces which are also used in the mobile phones or tablets. This gives the menu to the user to select the option of their own choice. For example: ATM is also the menu driven interface. It has all the options on the screen and the user has its own choice to select the option. Not only the ATM, there are most of the devices that uses the menu based interface.

Mobile phones are small but works like the computer [1]. They are in different sizes and specifications. The only size of the mobile does not show the interface of the system. The user interface means the user and the computer both can interact with one other. Be that as it may, not at all like PCs, the screen size and determination limit cell phones in showing content [1]. Exact values for mobile phone user interfaces does not exist, some applications are also available for desktop also. These issues include fixed screen, lack of feedback in physical mobile phones and computers are different in from each other. These are different interfaces for both, but most of the demands are common in both of them like Wi-Fi, Bluetooth, photo gallery, engine and many more. Computers are large in size and they are stationary, whereas mobile phones are small in size and they can be moved to anywhere while users are walking, travelling etc.

2. Literature Review

Usability is the ease of understanding the software or application. User interface plays an important role in increasing the usability of the software or application. User interface is the medium of human computer interaction. If the application is not fulfilling the requirements of the user

then this is fail for the user. Due to the less cost of the products, there are different kind of users. Some people want good product in good cost, but some of the people want good product in normal or less cost. It all depends on the requirement of the user. Due to the increase in the diversified users, there is increase in the requirements or demands of the users. The challenges for designing those interfaces have become complex. These design issues are as following:

There are different authors, these authors have discussed different problems. I have discussed these problems and their solutions in this paper.

- User characteristics issue [2]
- User interface type and design issues [1]
- Message construction issues [2]
- Display graphics design issues [2, 8, 9]
- Look and feel issues [1, 5, 7]
- Performance issue [2, 5]
- Language barrier issue [1]
- User experience issue [4] [7]
- Complexity in UI design [3]
- Guideline issues [6]
- Navigating the interface [8]
- Organizing the display [8]
- Interaction design issues [10]

In **user characteristics issue**, a user is the person who is going to use the system, the user is not always the human, and this can be the human, the machine or any other living thing. [2]

It depends on the type and identity of the user. This is the issue for the developer, if the developer knows that for whom he is developing the product then he has to make it according to the user, not according to himself. This issue can be resolved if the developer observes the user first to think that what type of product should be good for the user. User can be of different types. The user can be

- o Nave user
- o Sophisticated user
- o Specialized user

Nave user is the person who has very little link with the system. For example: customer of the bank.

Sophisticated user is the user that uses the system and they are also comfortable in using that system. For example: manager, accountant of the bank.

Specialized user is the user that are expert in using the system, administrating and maintaining the system. For example: administration, system maintenance engineer.

In **user interface type** issue, there are two types of issue. One is command line and the other is graphical user interface. But now the trend id changed from command based user to the graphical user interface. In graphical user interface, the user attracts because of colours and images. But this issue can be resolved if the developer gets the complete requirements about the interface that what type or style of interface is demanded by the customer. The customer should clear all the requirements as well. The prototype is developed to solve such problem, because this is basically the demo about the complete system. When this is shown to the client, the client then justifies that this is suitable for him or not [1].

In **message construction issues**, the message is the source of communication between the user and the system. This is the main issue in the user interface. The issue is because of the construction of the message. The construction means the size of the message, font of the message, message type, error message and the content of the message [2].The size of the message should be normal, it should not be very large or very small. The message type should be decided according to the user. Error message is also the message from the windows. This is always useful for the user, because if the user click on the wrong button or not following the correct instruction then this is helpful to notify the user from damage. These issues can be resolved by having the message construction according to the user and error message notifies the user, when the user faces any issue [2].

In **display graphics design issues**, the author emphasizes on two terms. One is the organized items and the second one is the use of colour and third one is visual delight. In **organized items**, if the items are organized in a proper pattern then they looks better than the scattered one. This issue not only occurs in the software or any application but also in using the windows desktop, we see that if all the items are scattered then this looks bad [2]. This problem can be resolved by using five primary interaction styles (direct manipulation, menu selection, form fill in, command language, natural language) [8]. This is difficult to search the items from the scattered data. There is the solution that items should be places in an organized manner and they should be settled alphabetically, or in ascending or descending order according to the choice. They can also be organized in the menu table or in the folder. There is the simple example for explaining this issue with solution. Organized data can be like this:

Fig. 1 Well organized controls

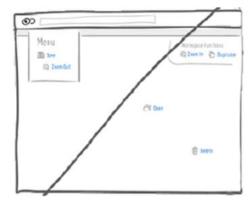If the data is scattered, it shows like this:

Fig. 2 Scattered controls

In **use of colour**, the colour should be normal, if the background colour is light then text colour should be light, but if the background colour is dark then background colour should be light. They both should contrast from each other. For example if we are having black background then we cannot write with the black colour. We can write by using white colour. Because black and white have good contrast. If the text colour is very light then this issue can be happened that text is not readable.

But here the colour of the text is better not very light that why this is readable.

In the **visual delight**, the main issue happened in the exact measuring of spacing or in contrasting the colour and in padding the data. If the data is completely spaced and set in a proper manner then this looks fine and also readable.

But, if data is in a full paragraph and lengthy paragraph, then this is not easy to understand the main points. Like this issue is shown in the picture. This process will catch single eye.
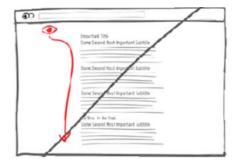

Fig. 3 Visually disturbing interface

If the user write the data in the good pattern but divide this into paragraphs and arrange the data in such a way that he bolds the highlighted points. Then this work is eye catchy.

Fig. 4 Visually soothing interface

In **look and feel issue**, look means that how the interface looks to the user and in feel the response of the person when he looks the interface. If the data is organized and like a google design, there is not the scattered data, this is easy for the user to understand the display and it's working [7].

In **performance issue**, the user is using the application but the application is not compatible with the system. In such cases there is the issue in using such application because this is not suitable [5].

In **language barrier issue**, there is the fixed language that is using for the whole system. If language is not understandable for the user then this creates the issue. The solution is that there should be the option to change the language to understand the application like that in google [1].

In **user experience issue**, the user experiences all the problems which I have listed above. These problems include performance issue, interface issue, language barrier

and many more. These are the common problems which are mostly occurred [4].

In **complexity in user interface**, user interface design and coding can be complex. The application is announced to make the sketch of the user interface. There are some specific keywords, which are used to draw the sketch of the interface. This is like the paint, which is available in windows. The person can draw the complete sketch of the complete interface. This basically allows the user to drag and drop the items and to arrange the items of their own choice [3].

In **guideline issues**, the user should explain his all the requirements and the software engineer should follow the exact guidelines. From the past time, interface designers have tried to write down the guidelines to guide the effort of future designers [6]. These guidelines are the final

In **navigating the interface**, there is a fixed pattern to use the instructions in the interface. Like that if we have to install or uninstall the application, there are fixed rules and principles to do so. The user has to follow the following rules for this process. Navigating means to make the system with the fixed boundary and principles. No one can change anything with their own rules. Everything happened in a sequence. For example: short cut keys for copy, paste, undo, etc.

In **organizing the display**, display design is a large topic with special cases. There are high level goals with guidelines as well for data display.

- Consistency of data display: during design process, the format, colour, and capitalization everything written by the user should be according to the standardized format.
- Minimal memory load on the user: user should not be required to remember the information from one screen for use on another screen.
- Compatible data entry according to the display: the format of displayed information should be linked clearly to the format of the data entry.
- Flexibility for user control: user should be able to get information from the display in the form most convenient for the task on which they are working. For example, the order of columns and sorting of rows should be easily changeable by the user [8].

In **interaction design issues**, the user cannot interact with the system. These issues include: bad contrast of colours, scattered data, bad interface, message construction issue etc. there are different issues because of which user don't interact with the system because of which they don't understand the system clearly. The designer should understand all the issues while making the software.

3. Conclusion

Everything in this world has some principles to work. There are some rules to set the things in the pattern. All the main design based issues are discussed above. I tried my best to explain the issues by using diagrams. All the problems are discussed above in the form of table also.The interface can be better than before, if we use the principles of HCI. If the developer take care of some points then this is better to use such applications in the daily life.

4. Future Work

There are different type of issue and different authors have discussed different issues. All the issues are resolved according to the principles of HCI. There can be future work in this field to make interfaces more attractive and good.

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