SURVEY ON USER INTERFACE DESIGN

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Abstract : User interface (UI) plays a vital role in software. In terms of visibility, its design and precision holds the primary importance for depicting the exact amount of information for the intended user. Every minor decision taken for the designing of UI can contribute to the software both positively and negatively. Therefore, our study is intended to highlight the strategies that are currently being used for successfully designing UIs. In order to represent the software and all its objectives, the UI design plays a crucial role. Software will not be communicated to the user for its possible benefits if the UI design is not created with relevant and significant amount of information. For ensuring the software quality, it is a key factor that the user should be able to understand the system fully for utilization. Hence, the UI design is the only face of the software which is visible to the user and hence, if the user is unable to understand and make use of it fully then he will not be able to use the developed software at all. In addition to this, for any good quality software, its UI design should clearly show what are the main features and functionalities of the system. Therefore, it holds an important place for the quality of the software.

Keywords – **User interface design, UI programming, Software development**

I. INTRODUCTION

User interface is the representation of the software or business to the user. It is displayed in terms of pictures, sounds, colors and text. The communication with the user on behalf of a system is performed by using a UI. Therefore, the minor details in designing as well as displaying the UI play a vital role in creating an impact of the entire system to the user. There are various aspects involved for the measurement of whether a UI design is successfully communicating the intended impression to the user or not.

For designing a good UI that can represent the intended amount of information to the end user, it is very important to maintain the involvement of the intended user of the system throughout the designing process. In this way, the design will be made according to the expectations of the user and thus will be successfully utilized. A good UI design is always expected to have a good error handling strategy, so that the end-user is not irritated by repeated attempts for doing a task. It is also important to let the user know exactly what error occurred so that he can take further steps accordingly. This factor is extremely important for doing online transactions. Security is a very important feature for E-commerce websites and therefore, while designing the transaction pages the user should be clearly shown about the security status. It is important that a UI design is tested against varied platforms so that when it is viewed by a user, it should display all the information as originally designed. Proper manuals for the usage and help instructions should be given to the users, so that the new users of the system can be appropriately accommodated. It is important for a UI good design to have 'appropriate' information displayed in it. This information should not be too much or too little. It should just be enough to represent what is intended to be conveyed to the user.

The UI design should clearly show and depict the software system objectives. The user should be able to distinguish between the websites he is visiting. For an e-commerce website, the design should clearly show the user what the website is about. In this way, the user will be able to surf faster and extract the related information quickly without having to go through the entire text, just to find out what the website or the system is all about. In addition to this, the objective of the system has to be kept in mind during the design of the UI. The user should be shown what the system supports and what it does not support. For a political website, it should clearly show that it is meant for political purposes and not some general public opinion. So that the user is not mislead by the displayed information and gets the benefit that was intended by the system during its formation. Another way of showing this is to clearly indicate the objectives of the UI so that the user is aware of the issues related to it.

II. Related Work

With the growing utility of the online content and systems, the users are getting involved in running the businesses as well as general online surfing. The awareness of the end-user about the system at hand is growing as each day progresses. In this scenario, it is important for a designer to consider that the UI design is basing its updates as well as construction on the user feedback. For this matter a constant involvement of the end-users should be made sure during the designing process. Even after the final product should be launched, still the improvements and later versions of the UI should be based on the feedback it has got from its potential users. This process helps in constructing and designing the UI in such a way that it becomes more *user friendly*. The feedback system generally helps the organization as well for developing more user oriented UIs so that their company aims and mission is highlighted.

III. User Interface Design

The main purpose of user interfaces is that they should match and satisfy the skills and expectations of its users. A system will always be judged by its users not by its functionality, but by its interface design. Many software systems are never used because of the poor interface design as this will confuse the users and will lead to many catastrophic errors

3.1 Human factors in interface design

There are many human factors which should be considered before designing an effective interface. These factors could be like limited memory as most of us cannot remember more than seven things at one go and if a user is presented with more than seven things to remember instantaneously he is more susceptible to make mistakes. It is natural that users make mistakes when they use new interface software and things like alarms or messages might panic the user and will become the reason for more mistakes. There are different kinds of people who think differently and prefer different things like pictures, special audible, menu style, text etc. and there are people with different physical and mental capabilities and a designer should keep all this in mind before designing an effective user interface which can be used and appreciated by everyone.

IV. UI design principles.

There are some principles which when followed will make a developer a good interface designer. The user interface should look familiar to the user i.e. it should be based on the use terms rather than computer concepts like documents, folders which can be replaced by directories, file identifiers etc. consistency should be followed when commands and menus are taken into consideration. They should appear similar in format and punctuation. There should not be any confusion to the user when using or operating a command and he should be able to predict the operation and consequences of commands. Users should be having the options of recoverability to allow them to overcome their errors. These include things like an undo and redo facility. The interface program should be provided with manuals to guide the user and user diversity should be observed to make the interface to support different users.

An interface should be designed with proper colors and objects. Colors should be used restrictively with a meaning. Proper color pairing should be observed and at the same time people with color blindness should be taken into consideration. Objects like buttons, menus, and icons should be used.

Navigation should be made easy. Proper style of interaction should be followed with proper language and symbols. A bad interface will produce a useless system.

Table 1 Rules to be followed in creating an effective interface design.

Rule 1	Consistency of the software
Rule2	Shortcuts for the convenience of frequent users
Rule 3	Feedback information
Rule 4	Designing dialog boxes to show the status
Rule 5	Recoverability to minimize errors
Rule 6	Action reversal- undo
Rule 7	Design in a way that the user is in control of the software
Rule 8	Minimize instructions and information to make it easy for the user to remember things.

V. Evaluation of User Interfaces

Electronic mail (e-mail) systems are the most widely used interfaces of our time. Free as well as economically priced solutions to effective online communication are available. There are other websites that are used for online shopping, banking, transactions, etc. In such websites, the UI plays a vital role in the success and further progress.

In general, there are two types of such websites:

1. The websites that are actually representing a business are already present in the real market offline, with the online business serving as an extension to the business.

2. The websites that are representing the business which is only present offline, with only the shipping and delivery system etc. present office.

VI. RESULTS AND DISCUSSION
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The systems that are successful today have given primary importance to the UI design and development. In order to enhance ones business for possible benefits, it is important that UIs are designed in such a way that the user feels easy and comfortable in using the software. The right choice of colors and background is extremely important in the UIs. They are used to emphasize on the target products.

In the websites that are used for e-commerce and trading, the UIs play a very important role. They have the dual role of serving as the identifier of the main content of the website as well as the advertisement for future work. A good UI would be extremely beneficial for the system, in this way. Similarity and consistency between all user interfaces is an extremely important feature. A standard should be maintained between the interfaces across all sections, so that the user gets the true picture of the

relationship between different sets of pages across a software system. A well written and well designed User interface will always be appreciated because of its ease of interpretability. In a UI design, it is often noticed that when it is tested on one platform and it is opened using another software/platform where it has not been tested before, the UI will not remain in its present shape. This is a very important feature that has to be kept in mind.

As for the online systems, the users can belong to any region of the world; hence, the similarity of the platform cannot be assured. Even if the users come from the same geographical area, still the designer cannot assure which software they will be using to view the UIs of the system. In this case the UI has to be designed in a flexible way.

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