User Interface

Assignment 2&3

Ques1. Expalin basic principles of user interface design?

Ans1. Usability:- Usability means user-centered design. Both the design and development process are focussed around the prospective user — to make sure their goals, mental models, and requirements are met — to build products that are efficient and easy to use. To improve usability, it is important to emphasize the following three aspects:

1. The interface should rapidly become familiar to the users.

2. Users should be able to complete their tasks easily and as fast as possible.

3. The way the interface works should be easy to remember upon revisiting the web site.

b) Consistency:- Lack of consistency frustrates users and raises their learning curve. Inconsistency can be a great and powerful tool, so it is highly recommended that you be careful when to use it. Define a pattern and follow it, be it for text, colour code or actions flow.

c) Least Surprise:- Users have expectations, and the role of a UI Designer is also to not disappoint them. This principle is a very simple one, but necessary: your UI should be designed to not surprise the users and be as obvious as possible.

d) Recoverability:- The UI has to be able to help the user repair their faults (and even software faults!). It ranges from having edition capabilities for already stored information to things like confirmations of actions (like in the image below) or the capability to restore things to a previous state (Undo buttons, for instance).

e) User Assistance:- Creating an interface that helps and guides the user must be the biggest goal of a UI designer and is a key point on ensuring they can leverage your software to its full extent.The UI shouldn’t mislead users and must provide them with meaningful feedback — you must induce them to the right mental model.

Ques2. What are characteristics of a good interface?

Ans2. a) Utility:- Utility is the result of the value-effort ratio. Users need a certain level of motivation in a certain context with certain expectations in order to use and interface to complete various tasks. So, in other words, did the effort put by the user worths the value of the results? Did it meet the user's expectations?

b) Clarity:- It is very important to make web site's content very clear, to avoid ambiguity that can cause confusion. Hierarchy and flow must feel natural and logical. Use titles, subtitles and captions in a consistent way. Navigation must be easy and natural to use and to understand. It must be intuitive which means users should find the features without have to search for them. Be careful to select navigational terms correctly and use icons (visual metaphors) whenever possible.

c) Concision:- We are often scared not to be clear enough and that makes some of us give too many details. That should absolutely be avoided. Keep texts short and don’t label everything. An interface must be light, not over clustered. Too many elements or to much informations leads to confusion and adds to mental load. The fact is that if there is too much text, users won't read any of it. The real challenge when producing a user interface is to be concise and clear.

d) User-friendliness:- User-friendliness has to do with the level of user comfort and satisfaction associated with the use of an interface (user experience). It is closely related to familiarity.

e) Familiarity:- Everything needs to feel natural and based on common sense. Avoid chocking the users and make them feel disoriented. Metaphors used in everyday life can be put to profit. Using standards and cognitive ergonomics is the best bet.

Ques3. What is Cognitive ergonomics. Explain briefly its components.

Ans3. Cognitive ergonomics is commonly described as the science of fitting the system to the human. It consist of adapting systems, interfaces and processes to fit human abilities and limitations.

a)The law of least effort: - A user, for different reasons, doesn't want to lose time nor energy (physical and cognitive). So, users have a tendency not to learn nor remember functionalities if they don't seem useful. A good design will consider cognitive ergonomics based on the tasks that can be completed to allow new users to complete its tasks easily, rapidly, and in an as intuitive as possible way.

b)Humanizing the information treatment This has to do what is commonly called the mental load which takes in account the users senses and mnemonic limits, the limits and ways a user perceives, learns, remembers and think.

c)Optimizing perceptual memory:- Perceptual memory is a part of the memory which manage informations perceived with our five senses. It stocks the data in some sort of temporary memory, a buffer that's independent from short and long term memories.

d) Reading speed and distance: - Reading text on screen is between 20% and 30% slower than reading printed material. It is important to fragment informations in smaller chunks and use captions to encourage users to read the contents. Reading on screen occurs at a distance between 60 and 90 cm (35 cm for books). It is therefore important to compose texts using a good font and correct size and leading.

e)External cohesion:- The symbols used must be logical and efficiently represent the feature or function it is related to. For instance, both MAC and PC uses a trash can related to the delete function. The same principle applies when comes the time of choosing navigational terms. Avoid trying to be original and extravagant here and prefer using commonly used terms so users understand well. Also, colors and various effects can help differentiate interface elements from normal content.

f)Internal cohesion:- It is important to make recurrent use the symbols, terms, elements positions, methodology, etc. Consistency will make it easier and faster for the users to complete their tasks

Ques4. Explain 10 principles of cognitive ergonomics.

Ans4. a) Standardize:- In every domain including interface design, there are widely common way of doing things. For instance, electricity wires are identified using colors the same way everywhere. In

an interface, everybody will understand that an X placed on the up-right corner of a window will close it or that a magnifier next to a text field is used to make a search.

b) Use of stereotypes:- The stereotype is a concept very closed to the use of standards. In facts, good standards generally follow a stereotype. Let's take the example of wall mount a light switch. It is installed vertically and it is on when in up position and off when in down position. If you decide to install it horizontally, chances are the user will be confused. Also, we increase volume turning right or we increase the power of a machine by levelling up an handle, not by levelling it down.

c) Controls matching equipment layout:- Whenever possible, configure elements in a way that the usage becomes obvious. For instance, on a stove, the best practice is to position the power knobs using the same configuration as the burners.

d) Simplify the presentation of informations:- Well organized informations makes understanding easier and faster. Using design principles such as unity, proximity and alignment greatly improves the interface quality. Whenever possible, use icons or images which replace a lot of text (an image worth a thousand words).

e) Present information in appropriate detail:- Not all users and not all tasks require the same quantity of details. Learn to display just the necessary amount of information and use tool-tips instead of clustering the interface.

f) Present clear images:- Using icons, metaphors or images, be careful to make it so the users is able to see and interpret them clearly. Images must be visible. They must be of appropriate size, location and distance. There should be no obstruction and they should contrast with the background or their environment.

g) Using redundancies:- Redundancies have to do with consistency, standards and stereotypes. It means to repeat the message many times different ways to reduce the risk of errors to occur. Let take for an example a stop sign. It is red (which is used for danger and obligations), it is octagonal (quite a rare shape to see) and it tells us to stop. The message is repeated three times. Even though STOP would be written in a language you don't understand, you would still know what the panel means.

h) Using patterns:- Using a pattern makes information easier to understand and anything unusual sticks out very efficiently. So, you can group elements by themes to simplify tasks, you can use graphs so number data become easier to understand or use charts to compare numbers or quantities.

i) Provide variable stimuli:- Just like something unusual sticks out of patterns, anything new of a different aspect is easier to notice. That is actually why emergency vehicles sirens are changing pitch and rhythm in order to be more easily noticed. For instance, it is a good practice to have different presentations depending on the type of information or you can use an animated element that grabs attention very easily.

j) Provide instantaneous feedback:- Use feedbacks at all possible time to confirm an action or a process. Let users know that their content is downloading or tell them what action should be taken. You can also use transition from page to page to let them know they are leaving a page to another. For instance, there is a reason why your computer keyboard clicks. It is to let you know that you pushed the keys correctly so you don't need to look at it or constantly look at the screen.

Ques5. What are essential ui design laws?

Ans5. a) POLA Principle:- POLA stands for Principle of least astonishment. It states that if a necessary feature has a high astonishment factor, it may be necessary to redesign it. According to this principle, design should be adapted to the user's experience, expectations, and mental models. Human being only able to pay full attention to one thing at a time, it is important to reduce the mental load and, even more important, novelty should be minimized.

b) MAYA Principle: - MAYA stands for Most advanced yet acceptable. It states that since people are naturally resistant to change, novelty and innovations, it is important to rely on standards as much as possible. Bringing novelties should be done gradually so users can get used to it. Since users have different levels of comfort, offer traditional fall-back options when novelties are integrated.

c) Hick's Law: - Hick's law states that the time it takes to make a decision increases with the number and complexity of choices. Knowing this, it is important to reduce the number of choices presented to users. Too many choices adds to their cognitive burden, their mental load. By giving too many choices, there are chances your users will run away to another web site. Learn to identify essential and secondary contents, apply hierarchy, make navigations shorter and use contextual navigation (sub-navigation) if needed.