Assignment1

Mohammad Fakhruddin Babar, ID: M564K763

January 18, 2023

Q1

Devise an outline, consistent with the scientific method, which interface researchers should follow to validate their designs.

Ans:
From my point of view following outline should be followed by interface researchers to validate their designs:

- Find a domain which needs an user interface
- Gather information on that specific field based on scientific research, get feedback from the potential user
- Look for similar works and observe the similar design
- Build a conceptual outline of the interface and take feedback from the real user and bring the changes in these design
- Build the primary interface and test it with the user whether they find it easy to use or not
- Build the fully functional prototype of the interface based on all user feedback and release a test version for the user for test run for certain period
- Release the interface for the general people after the observation period is over

Q2

List some characteristics of successful user interface designers with respect to their approach to solving UI problems

Ans:
List of characteristics:

- Think beyond the user friendliness, intuitive or checklist
- Consider the data driven feedback of the user
- Focused on research-based data and tried to design accordingly
- Take the feedback from the user from time to time and update the interface accordingly

Q3

As noted in the book, some skeptics feel that accommodating diversity requires dumbing-down or lowest-common-denominator strategies. However, the authors claim that in their experience, re-thinking interface designs to accommodate these diversity situations will result in a better product for all users. Give an example of a product that meets the specific needs of a certain group of people yet gives all users a better experience.

Ans:
Voice input/ Natural language command could be example of this kind of situation. It had arrived to support the physically disabled person who does not have limbs, hand etc. But children or old people still can use this feature to perform their tasks. Illiterate people who can't write can use this feature for giving their commands. Even a regular user uses this feature when there is boredom or tiredness to type or any issues in keyboard.

Q4

List several reasons why certain people resist using computers and suggest possible ways to alleviate these concerns.

Ans:
List of reasons why people resist using computers:

- Privacy and security of data
- Not interested in learning certain skill-set to operate the computer
- Lack of portability
- Financial flexibility
- Having a complicated user interface/operating system

Solution:

- Gain the trustworthiness of the user by demonstrating the security measures.
- Design certain UI that needs minimum effort to operate the computer.
- Operating system should be easy to learn.
- Production of computer that can be in the range of low-level income people.

Q5

Suggest three usability measures that can be directly used to produce a practical evaluation of a system. Keep the goals of efficiency and satisfaction in mind with these measures.

Ans:
Three usability measures:

- Time to learn : Time to learn a new interface should be minimum.
- Speed of performance :
- Rate of errors by user : Likelihood of error should be reduced in the interface. Enough guideline should be available for the user to handle the interface.

Q6

. Describe three populations of users with special needs. For each of these populations, suggest three ways current interfaces could be improved to better serve them.

Ans:
Three populations of users with special needs:

1. Visual disability
2. Hearing disability
3. Child and adult user

Suggestion to improve current design:

1. There should be audio description / direction of the interface, position of the menus for blind people
2. Audio/Video should have always subtitle so that a user still can get all the information if he has hearing loss
3. There should have direct manipulation type menus for child / adult people, so they don't need to put a lot of efforts for putting their command

Q7

Suppose you need to design a system for users in both the United States and Japan. Present a list of cultural differences that you should be aware of so that a successful design can be made.

Ans:
List of cultural differences:

- Date format in Japan is mostly like YY-MM-DD where in US its MM-DD-YY
- Time formate
- English is primary language in US where Japanese people speak Japanese language. So, there should be language compatibility in the design
- US has more racial diversity than Japan
- Social hierarchy is more important in Japan than US
- Currency format
- weights and unites of measure

Q8

In certain interfaces, it is necessary to inform users of an abnormal condition or time-dependent information. It is important that the display of this information catches the user's attention. Suggest five ways a designer can successfully attract attention.

Ans:
Five ways to catch attention:

- Pop-up window arrives when essential information needs to be attracted
- Show important data in a graphical mode a
- Might show the essential information in bold and underlined format
- Show info in animated graph or text
- Use of different fonts than regular fonts

Q9

Name a piece of software you often use where it is easy to produce an error. Explain ways you could improve the interface to better prevent errors.

Ans:
At the time of programming in C, for a simple mistake or syntax error, compiler (e.g. Code::Blocks, VS code) doesn't show any result. Though it shows some clarification, sometimes those clarifications are not well enough to fix the bug. It can display some partial result of the code like Matlab or Python. I think any C compiler can take the following points into consideration:

- Show result of the code till the error comes
- Better representation of the error message so that it can be addressed easily

Q10

List some human physiological or psychological factors that can influence human operator performance.

Ans:
Physiological or psychological factors that can influence:

- Boredom, tiredness
- improper rest
- Age, gender, culture of the user
- Physical disability
- Cognitive or perceptional disability
- Frustration
- Nutrition and diet
- taking drugs, drinking alcohol
- Previous bad experience

Q11

Give a brief explanation of the Eight Golden Rules of Interface Design. State an example you have seen on a device, computer interface or web site that violates those rules.

Ans:
Eight Golden rules of interface designs are:

1. Consistency: Throughout the interface, data representation, fonts, capitalization, menus, layout, and abbreviated terms should be consistent.
2. Universal usability: Designer should focus on bringing an interface which is quite easy to go for a wide diversity of users. From novice to expert user, from children to adult person, unskilled to skilled level, disable person, cultural variation etc.

3. Offer informative feedback: For any actions, in inference there should be some modest informative feedback for minor and frequent actions. For infrequent and major actions, response could be more substantial.

4. Showing dialogues to yield closure: At the time of submitting any forms or important data, interface should show a dialogue for further confirmation from the user.

5. Prevent errors: Thinking of the worst-case scenario, interface should be designed. If they made any mistakes, give them the proper feedback. There could be a reference item that can be followed for filling out an item, invalid data should not be allowed to enter (e.g.: numeric character in name field, month field should be less than or equal 12 etc.)

6. Reversal of action: This feature is very useful at the time continuous form fill out that is comprised of many pagers. If it needs to edit any entry from the previous pages and if these features exist, it increases the user satisfaction and saves time for the user.

7. User control: Interface should have some control that enables him to show a few information of the web-page, or sorted data from a vast collection of data etc.

8. Reduce short term memory load: Important data should be carried out so that the user does not need to memorize the data. For example, at the time of booking a ticket, in payment gateway page, it can show the departure/arrival date, port information etc., so that user does not need to go back to cross check the info for verification.

In popular video game FIFA, after playing a match, the user gets the option to restart the game or end the game. If the user selects restart option, it asks for confirmation of the user. But if user selects end match, it does not ask for confirmation and quit the match. As the two menus are one keystroke apart, sometimes the user mistakenly selects end match instead of restart. And it takes a lot of time to start a new match. If interface has the dialogue for confirmation at the time of end menus, this hassle can be avoided easily.

Q12

Don Norman suggests organizing screens and menus functionally, designing commands and menu choices to be distinctive, and making it difficult for users to take irreversible actions. Norman also says to provide feedback about the state of the interface (e.g., changing the cursor to show whether a map interface is in zoom-in or select mode) and designing for consistency of actions (e.g., ensuring that Yes/No buttons are always displayed in the same order). State one example you have seen where you know these rules have been violated. Although this is crucial to a user interface's success, suggest why there may be challenges to implement some of Norman's guidelines.

Ans:
In payment gateway, at the time of providing credit/debit card information, when we need to put expiry data of the card, most of the time there is no written instruction of the format. Assume the expiry date is 08/27. Sometimes you must enter slash (/) and sometimes it takes automatically. Sometimes they put separate boxes for months and years. In the year fields sometime still needs to put all four digits say 2027 which is not matched with the physical card. Users need to correct the entry. I think each payment gateway should have universal consistency in form filling of expiry date with the physical card.

Q13

Clarify the difference among guidelines, principles, and theories.

Ans:
Guidelines are basic thing, and we can compare it with advice. It provides some instructions from past experience, previous design, focused on some good practice.

Principle is something like mid-level, more structure. It is used for creating theories. It helps to facilitate a structured design process to show the data, accessibility for the wide variety of users etc.

Theories are something of a remarkably high level which can be applied in a lot of situations. It's not awfully specific or low level. From theories a designer must have some direction and need to follow those things. It can be used for teaching or can be used for training.

Q14

What are "accessibility guidelines"? Discuss progress from organization(s) that are taking the lead. State a few example guidelines.

Ans:
Accessibility guidelines provides information on how to make the design more accessible by wide variety of people (e.g. child, adult, disable person, different culture, age , gender etc.)

A few accessibility guidelines are:

- Providing text for any graphical or image representation
- If there is any multimedia presentation, there must be some alternatives.
- If anything has been presented with color, it should have something alternative to help the color-blind people
- Everything should be well titled and navigated for easy identification

In MS Word, it has feature to read out the documents. We can provide voice command in phone. Those are few example that help disable person to get the access of the interface.

Q15

What is the difference between micro-HCI theories and macro-HCI theories?

Ans:
Difference between micro-HCI and macro-HCI:

Micro-HCI: Its more focused, awfully specific, looking at certain parts but very deeply. Focus on measurable performance. Looking at specific things like performance, error, speed etc. Theory of level, stages of action and consistency are micro-HCI theories.

Macros-HCI: Its basically focused on the big picture, prominent level, extremely broad. Case studies of user experience, how frequently users are using the design, referring to the design, returning users etc. are focused on macro level.