Assignment 2

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1[6 points] The State of Maryland is developing a web-voting interface. For selecting the candidates, one design (RB) is a set of radio buttons and another is (CB) a combo-box (drops down when selecting the scroll arrow icon), both using standard fonts at 10-point size.

a. Compare these two designs when there are 4 candidates and predict the relative speed of performance and error rates. Support your choice by a thoughtful argument.

Ans:
There are only four candidates. In the radio buttons, it will be easier to find the option for people than in the combo box. In the combo box, it will be easier for people who are a little bit familiar with mobile interfaces or computer interfaces. CB takes a little bit longer time than RB. The adult person and the person who is not familiar with mobile or similar interfaces will find it a little bit difficult to give their vote. In RB, relative performance will be higher than in CB, but error rates will be lower in RB. Radio buttons have more usability than combo box. I support RB in this scenario. A user just needs to select the option from the display and there are only four candidates. Voters can find the candidates very easily and can give their vote. If there are so many candidates, then CB could be a good option.

b. An expert reviewer complains that both designs may work with young users who are familiar and expert in using a mouse, but that there will be problems for elderly and motor-impaired users who have difficulty controlling a mouse. The reviewer recommends a new design that includes a larger font (20-point size) and a numbered list to allow selection by keyboard easily. Describe a Participatory Design or Social Impact Statement process that might clarify this issue with elderly users.

Ans:
In the original design, the font size was only 10. It's harder for the elderly to locate the menu. So, increasing the font size is really a good approach that might help the elderly people, and they can give their vote using a keyboard by just pressing the button. For the participatory design, some elderly people can be engaged in developing a voting system. Click the buttons like an electronic voting machine, and a touch screen type interface can be introduced. Or they can circulate a statement in the social media/newspaper by describing the new voting process which will be more usable for the elderly people.

c. Design an experiment to help resolve the issue brought up in Question b. Assume you have substantial resources and access to subjects.

Ans:
To resolve this issue of question B, a participatory design can be modeled. Elderly and physically disabled people can be brought to participate in this process. Their direct feedback and the movement of their eyes and hands can be tracked. Based on the data, a new interface can be proposed and evaluated again by them. After doing a few iterations, a final interface can be proposed for the vote.

2. [2 Points] Provide a definition of participatory design. Give three arguments for and three arguments against participatory design.

Ans:
In participatory design, the target user will actively participate in designing the interface with the interface design team, say through paper mocks or drawing the interface.
Three points in support of participatory design:

1. Get real and instantaneous feedback from the users.
2. More acceptable to the user as those interfaces came out of their mindset.

3. The trial and error method can be applied in designing the interface based on the feedback from the user.

Three points against participatory design:

1. There is a challenge in gathering experienced and wise users who can give thoughtful feedback on interface design.
2. Some vague and unreal feedback may come from the user.
3. Sometimes it is harder to consider all the feedback. Feedback might be unorganized. The user's feedback should be analyzed.

3. [1 Point] Consider a system that dos not yet exist. An example if a totally automated fast-food restaurant, where customers order via touch screen interactions, pay by swiping their debit or credit cards, and then pick up their food–analogous to the self-check-out at some supermarkets, but even more extreme. Discuss how you conduct a contextual inquiry for a system that does not yet exist.

Ans:
I will make a prototype of an interface from where a user can select their food, say burgers, drinks, choose the foods, size, mixture, texture, etc., and go for the payment option with a card or cash . In the usability testing lab, I will bring people one by one from different ages, genders, cultures, etc. Give them the interface and ask them to select food. Give them the food they have selected. In a testing lab, we might give the user 2/3 options of food so that it becomes easier to provide food. After selecting the food and obtaining payment, I will provide the selected food to them. I will interview them about how they feel using the interface and what the shortcomings are in the interface. I will take into consideration their suggestions and finalize the interface.

4. [1 Point] Describe at least three different types of expert review methods.

Ans:
Three different types of expert review methods:

1. Guideline reviews: Experts can review whether the interface has followed all the necessary guidelines or not and give feedback accordingly.
2. Consistency inspection: They can check whether the interface is consistent throughout the interface in terms of font, colour, heading, data representation, etc.
3. Cognitive walk-through: They can check and give feedback on whether all classes of users can use it or not. For physically disabled people, it has alternate options or not. For video, it should have subtitles; for data entry, it should have some simple drop-down type menu; natural language processing system etc.

5. [1 Point] Create a bird's-eye view of an interface you wish to investigate. Focus on detecting inconsistencies and spotting unusual patterns.

Ans:
I'll print a bird's-eye view of an interface and mount it on the board. Ask my team to check whether there is any inconsistency in color, font size, heading, unit of measurement, etc. After identifying the mismatch, we fixed the interface . If there is any other format of the interface, say the paper version of the newspaper, I will check whether it is consistent among all the formats or not.

6. [1 Point] Compare and contrast controlled psychological experiments and usability tests in the evaluation process of user interfaces. Be sure to include the benefits and limitations of each

Ans:
In a usability test, a user will be given an interface and the movement of the user will be tracked by an eye tracker, glass, or mobile camera, and later that movement will be analyzed to change the interface.
In controlled psychological experiments, scientific methods are deployed to analyze the situation. where some dependent variables are kept fixed for all users and a small number of independent variables are varied. And all the biasing factors are controlled carefully.
It's harder to do controlled physiological experiments as you have to find out specific things about the interface and gather a group of users from a certain class to carry out the experiment. But, in a usability test, you give the user the interface and track the movements and ask them a few survey questions.

7. [1 Point] Give two reasons why expert reviews are useful. Also give two limitations of expert reviews.
Ans:
Two reasons why expert review is useful:

1. Those experts know what to look for in an interface and what the shortcomings in the interface are from their past experience.
2. Get measurable feedback in the shortest possible time.

Two limitations of expert review:

1. We do not always have the appropriate expert available.
2. Cost of hiring expert.

8. [1 Point] At present, the drive to use Big Data to define or enhance corporate strategies seems to be a global business trend. State an example of where this data can improve a business, focusing on user interface aspects.
Ans:

In a manufacturing plant, there is a long production line, and different machines are deployed in the assembly line to meet the production target. There are a lot of micro-stoppages in the assembly line, and HMI is used for operating the machine. When the machine stopped, in the HMI, a message appeared stating the reason of the breakdown of the machine using the PLC feedback signal from the sensor. Then it becomes easier for the operator to solve the problem and reduce the downtime to increase productivity. Plant managers can use this data to analyze different attributes, say which problem is occurring frequently, which is hampering the productivity most, and use the result to increase the productivity. Modern human machine interface made it possible that's been used widely and one of the essential component for fourth industrial revolution.

9. [1 Point] Cite a past experience where user interface development methods might apply to another system development activity that might not have a strong user interface component.

Ans:
Facebook's user interface is more appealing, with users being able to handle everything with ease. They can post updates, upload images, get updates from their friends or common community, etc. There is no character limit for posting any status. But on Twitter, there are character limits. If it exceeds a certain limit, you must post it in multiple tweets, which is inconvenient. Interaction is not that handy, like on Facebook. Twitter can adopt some interfaces from Facebook to make it more user-friendly.