CS 465 Principles of UI Design – Homework 2
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Question 1

Non desktop user interfaces:

Interface one: Personal Digital Assistant (PDA)

-Personal Digital Assistant (PDA) has many uses ranging from phone and GPS to business and storage of data. PDA are commonly used as car kits and are fitted with different GPS to provide real time navigation. Many business have relied on PDA for mobile data applications. They are generally used to store information that can be accessed at any time and anywhere. Since they are predominantly used for accessing information anytime, it is designed to be small and can easily be carried around.

-Three strengths of the PDA interfaces are its size, touch screen capability, a full keypad. Since a PDA is meant for mobile use, it would not make sense for it to be big. Hence it is a good choice to keep the design nice and small. It was a good idea to make the PDAs touch screen. This is a very good design because it is useful and much more straight forward than having a keyboard. It is also a nice design to display a full keypad on the screen instead of a cell phone type design. This enables the user to type an alphabet in one touch rather than several touches.

-Three weaknesses of PDAs are its touch screen, keypad and the screen size. Although the touch screen is amazing, it could also be a weakness. You have to touch the screen with your fingers. This is especially problematic if the user has large nails. In order to fix this problem, you could have an actual keyboard attached to the PDA. When the keypad is displayed on the screen, the keys are usually small. So if the user has large fingers, it might be harder for them to press the buttons. This problem could be fixed by increasing each button size on the keypad. The screen size for the PDA is small. This problem could be fixed by making the screen bigger.

Interface two: I-Pod

-This interface can be used to listen to music for pleasure or while working out. It could also be used to watch movies or just for file storage. Since this is meant to be used when you are mobile, the i-pod has a small and sleek design.

-Three strengths of an i-pod are its easy control system, music filters and portability. The i-pod has an easy, unique control system. Instead of a typical sequence of buttons with arrows, in order to navigate the i-pod, it has a control wheel which makes navigation easy. You can filter music in an i-pod based on different criteria. This makes it easier to find a particular song. Because of the small design of the i-pod, it makes it easier for using it while travelling and working out.

-The disadvantages of an i-pod is that its brittle, screen size and it poor navigation system. You can break an i-pod with ease by just dropping it. In order to make it more durable, the designers could use a different material. The screen size is also really small. In order to fix this, the designers could make the screen size bigger. For all its advantages and innovative design, the i-pod fails to provide a user friendly navigation system. In order to navigate from the song screen to the main screen you have to keep pressing the same button 3 times. This is not very intuitive and can get frustrating if you want to navigate from the single song screen to the main menu frequently.

Interface three: DVD Player

-A DVD player can be used for watching movies or educational films. Hence it could be used in a house or in a school.

-The three strengths of a DVD player are its remote, size and easily connectivity. Because of the DVD remote, the user doesn't have to be near the DVD player in order to operate it. A DVD player is pretty
small in size. It is really portable and easy to store. It is straight forward to connect other devices (such as speakers etc...) to a DVD player.

The three weaknesses of a DVD player are that it can only play CDs with certain format. This can be fixed by making the DVD players compatible with other formats. These players usually contain buttons are usually pretty small. This problem can be fixed by making the buttons larger. A DVD player can't be used without a TV. This problem can be solved, by producing DVD player with attached screens.

Question 2

Person 1:
- One of the biggest problems that he faced with his desktop computer is that it was not mobile. This affected his ability to do work quiet a bit as he need to meet with groups and he was forced to meet them at a computer lab. In order to fix this problem, he just bought a new laptop.
- Cooling was another issue he had with his desktop. His desktop would get really warm and randomly turn off. This was a big annoyance because his computer would turn off when he was typing his paper and he would have to recover it and sometimes he would have lost data.
- He also found the desktop to be very heavy. Hence it was very hard to move it when he was rearranging his room although this did not really play any part in his efficiency of getting his work done. One possible solution that he suggested was to get one of the mac desktop computers which are not very heavy.

Person 2:
- This person also had a huge problem with the desktop weight. Although this did not hinder her ability to get work done, it was an annoyance none the less. The possible solution that she offered was to purchase a laptop.
- She has Ubuntu installed on her system. She found it really hard to configure some of her hardware (such as printers and faxes). One possible solution that she suggested was that the companies could publish drivers for both windows and Linux OS.
- She also mentioned that her desktop required a ton of maintenance. This definitely cost her a ton of time and definitely made her less efficient. One possible way to fix this problem is for the manufactures to produce reliable hardware.

Person 3:
- This person really likes to customize his computer. He said that it was not very intuitive to change general administrative things (such as desktop settings, mouse settings, etc...). It took him a while (about a year) to learn that he could configure his mouse and keyboard settings through control panel. He suggested that Microsoft has done a good job of fixing this problem in Vista by displaying at startup that lets you configure this settings.
- His second complaint was the fact that it take quite a long time to boot up his desktop computer. This affects his efficiency a little. A possible solution that he suggested was to make the desktop computer boo up faster but he had no idea as to how to do that.
- His third complaint was that his desktop was not mobile. This didn't really affect his ability to get work done but he found that it would be more helpful if he was able to move his computer. A possible solution would be to get a laptop.
Based on the this data, the learning constant comes out to be 0.69. One particular strategy the subject used was that for the first trial she typed the last eight letters of the alphabet in alphabetical order and then from 2-21 trials, she typed it backward. This was very efficient because you could look at the letters and just type them backward instead of trying to think about them. The subject did get distracted due to some external noise levels in the middle of the experiment. This cause her to incorrectly type some of the alphabets during two of the middle trials.

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<tr>
<th>Trial</th>
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Question 4
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(a) We are going to assume that the menu size is 14 pixels

\[ MT = a + b \times ID \]

\[ ID = \log(A/W + 1) \quad \text{log is log base 2} \]

\[ MT = a + b \times \log(A/W + 1) \]

\[ MT = 545 + 420 \times \log(84/14 + 1) = 1727.089 \]

(b) 50/50:

\[ 548 + 420 \times (0.5 \times \log(112/14 + 1) + 0.5 \times \log(56/14 + 1)) = 1701.289 \]

75/25:

\[ 548 + 420 \times (0.75 \times \log(112/14 + 1) + 0.75 \times \log(56/14 + 1)) = 2277.934 \]

90/10:

\[ 548 + 420 \times (0.1 \times \log(112/14 + 1) + 0.1 \times \log(56/14 + 1)) = 778.658 \]

So the absolute lowest time would occur if the ration is 100 percent. Hence the minimum choice time would for dynamic menu is 100/0.

(c) Hicks law only applies when a simple decision is required from multiple options. It doesn't apply if the options are lengthy and requires a certain level of study then it doesn't apply.