Problem 1

Solution

1. My cell phone:
   Good:
   (a) Each direction on the circle keypad opens a different item corresponding to a circle of four icons which can optionally be displayed on the desktop.

   Bad:
   (a) Time isn’t displayed on the outside while calling.
   (b) There is an option to change the shortcut for the down direction on the directional pad, but no option to change from the default four shortcuts for the other directions.
   (c) It is too hard to take video. There are no shortcut keys, and no direct menu items on the first level of menus. It takes a minimum of 5 button presses to reach the screen to begin taking video.

2. My car stereo CD-Player:
   Good:
   (a) The 7-way nob (up, down, left, right, clockwise, counter-clockwise, and press in as a button) takes a lot of clutter away from the interface since the one nob contains the functionality for 7 buttons. It also acts as a versatile unlabeled interface to provide a common feel to navigating the menus.
   (b) There is a “list” button which brings up a list of all of the tracks on the current CD. This is especially useful when using a CD filled with MP3 files, since there may be over a hundred MP3’s on the CD, and this allows an easy way to navigate through them visually.

   Bad:
   (a) Track list does not start at current track. When you are on track 50 out of 100 on an MP3-CD, you have to scroll through 50 songs just to find out which song comes after the one you are listening to. If you navigate the list to a song you want to hear next, but don’t select it because you want to finish listening to the current song, the list will close after a few seconds, and you will have to navigate to the song again.
   (b) The track listing for MP3s shows the file names, not the track title. This makes it hard to find songs, especially if the title of the song is not within the first 35 or so characters of the file name, since that is all that shows up in the list.
   (c) The front-side auxiliary jack is 2.5mm, which is an uncommon size and requires a converter to be able to plug in an iPod or anything else that uses the more common 3.5mm jack. This could be fixed by simply using the more common 3.5mm jack.

3. My car seat:
   Good:
   (a) To tip the front seats forward to allow access to the back seats, there is a large handle near the top of the back of the seat. This is better than most other cars which have the handle at the bottom which you have to bend down to reach.
(b) All of the electronic seat controls are in a cluster, instead of spread out like the mechanical controls.

Bad:

(a) The handle to tip the front seats’ backs forward blend into the overall design too well. I have often had people get confused and look for a handle sticking out of the bottom of the back rather than flush to the top of the back.

(b) On most mechanical seats, such as the front right passenger seat in my car, there is a small bar that you lift up to unlock the seat to move it forward and backward. The electric drivers seat has a cluster of switches in front, and there is a horizontal bar-like switch, but lifting the switch up moves the seat up and down. You must move this switch left and right to move the seat forward and backward. This is counter-intuitive to standard design of mechanical counterparts with the same purpose and feel.

Problem 2

Solution

1. Mom:

(a) My mom uses grade-keeping software as an English teacher. The new software her school invested in requires redundantly inputting grade-categories for each class rather than copying categories from class to class. She says that this has doubled the time it takes her to enter grades. She suggests that the developing company should speak with teachers to find out which functionality is most important to them rather than to administrators who are often awed at bells and whistles, but do not know how much efficiency is lost when certain features are removed.

(b) She has problems transferring PowerPoint files from her home machine to work. She has Office 2007 at home but Office 2003 at work. She says that even when she saves 2007 files as 2003-compatible, they still have errors. She suggests a tutorial of some sort to explain to users the difference between the two formats, and what they can do to avoid conflicts.

(c) She does not like having to go through so many steps to take pictures from her cell phone. She must get a card for her camera, put the pictures on the card, put the card into a converter, put the converter into a card reader, then put the reader in her computer. I suggested bluetooth as one solution, but Verizon blocks out file-sharing through bluetooth on all their phones.

1. Dad:

(a) My dad complains that the numbers are to small on his cell phone. He has to take out his glasses to read them. We came up with the idea that it should be possible to pick the font size.

(b) He uses an invoicing program for his business. He complains that the software requires too many clicks to print out an invoice. After clicking to print, the software asks if you would like to save, then shows you the print preview screen. From there you must click print again, which brings up the print dialog box. You must do this process for each invoice you wish to print. There is no group-print option, and no option in the preferences to take you straight to the print dialog screen on the first click.
(c) He uses a book-keeping program which he has used for years. He likes most of the program, except that at the end of each year, you must start a new book. The 2 different totals for recorded and cleared transactions are carried to the start of the new book. But you must go back to previous book to clear uncleared transactions from the last few days of the previous year. Furthermore, the new cleared total does not carry on to the start of the new year’s book after updating it in the old year’s book.

Problem 3

Solution

Learning constant:

\[ T_n = T_1 * n^{-\alpha} \]

\[ T_{25} = T_1 * 25^{-\alpha} \]

\[ 2272 = 12102 * 25^{-\alpha} \]

\[ \ln(2272/12102) = -\alpha * \ln(25) \]

\[ -1.67271 = -\alpha * 3.21888 \]

\[ \alpha = 1.67271/3.21888 \]

\[ \alpha = 0.51966 \]