**Part 1**

Identify three non-desktop user interfaces that you often interact with:

HDTV
Cell Phone (Sony Walkman Phone)
Camera (Canon Powershot SD)

1) Explain the different social/cultural/work contexts in which the interface is typically used. Describe how this has or should have affected its design.

The three non-desktop user interfaces that I have chosen are all recently acquired gadgets that I have purchased in the last year or so. Because I, as a tech savvy college student, have purchased these products recently, it’s obvious that they all satisfy me socially in the respect that they are all geared toward younger people with sufficient money to indulge in gadgets. Culturally, these sleek designed products all seems to conform to my taste for simplicity and ease of use. Automation has become a large part of our daily lives with technology doing tasks for us. On the HDTV, auto tuning has enabled me to not have to auto channel search for available television stations. Cell phones store recent calls so that I can have quick access to recent data. Digital Cameras interfaces will allow you to take pictures on the fly just as simple as an old fashioned point and click. The Digitization of products does not mean that they have not culturally been affected by its predecessors. HDTV, Cell Phones, and Cameras still all relatively reflect design and interface concepts from its analog days. HDTV menus are similar to analog TV menus and digital cameras still have special buttons that allow for flash. As mentioned in the book INTERACTION DESIGN, these advancements are built based upon the base interface and successful implementation of them.

2) Identify three strengths of the interface, i.e., what you think the designers did well. Explain your rationale.

   a. HDTV
      i. Interactive guide for easier interaction – This feature has allowed me to look at television shows currently on air prior to switching to it. The designers took into consideration that people did not want to navigate to a channel prior to knowing what was currently showing.
      ii. Picture in Picture – This feature allows for multitasking and removed the need for more than one television set in the room. The designer took into consideration that today’s users choice of available programming was so large that one view could no longer satisfy the audience.
      iii. No signal screen – This screen replaced the analog television’s static screen which was noisy and uneasy on the eye. Instead, designers chose a black screen with a no signal text to signal to the users that the signal strength is inadequate.

   b. Cell Phone (Sony Walkman Phone)
      i. Designers placed large intuitive buttons on the front that automatically played music on push – This button was especially thoughtful because the product is
marketed as an mp3 phone. Users who buy this phone bought it specifically for its music playing capabilities.

ii. Designers added a feature to use the flash as an emergency SOS light. Designers took extra time to find ways of using existing features in novel ideas that could potentially be useful in certain situations – such as stranded somewhere at night.

iii. Touch sensitive keys in the front – This designed was esthetically pleasing to the eye as well as served to reduce the number of accidental phone dialed while in user’s pockets.

c. Camera (Canon Powershot SD)

i. Designers did well in preserving the same feel and shape as a regular camera. This allowed for quick and easy navigation that everyone is already familiar with.

ii. The ability to rotate the LCD screen based on the tilt angle has allowed users to auto-rotate pictures to select the best viewing angle. Designers understood that holding a camera in one hand typically resulted in viewing angles that were not always straight for your viewing pleasure.

iii. Designers designed the product into a very sleek design that could fit into someone’s pocket. They eliminated the bulges and curves associated with traditional cameras in favor of mobility.

3) Identify three weaknesses, i.e., what you think the designers did poorly, and how these weaknesses could be addressed with a re-design? Explain

a. HDTV

i. Designers did not design the television well when moving from channel to channel. The time it takes to surf from channel to channel was drastically increased compared to analog televisions. This lag has made channel surfing almost impossible with 2-3 second wait time between each channel.

ii. Designers also did not design the remote control in a logical manner. Buttons were placed in odd areas that are often hard to find. Just like described in the book, this remote control is jam packed with features that could have been placed in interactive menus instead of on the controller. Redesigning the remote for simplicity is needed.

iii. Another problem is the placement of connections. Designers combined inputs for HDMI, coaxial and AV making connecting more than one external input device onto the television a huge hassle. A redesign with more inputs could have easily avoided this shortfall.

b. Cell Phone

i. Designers placed a center joystick that has a center button that juts out. Even though keys are touch sensitive, the one joystick button that juts out are easy to break and becomes lose.

ii. Keys are packed and are hard to press. Had designers raised the even surface of each key, it would have made it much easier to input numbers.

iii. The charging bay does not have a protective cover. This flaw has caused problems when charging the cell phone. Often, users would have to wiggle the connected charger to enable it to charge.

c. Camera
i. Control for this digital camera did not come in the form of a rotational scroll. Instead, the designers chose to enlarge the LCD screen size and place an up navigation through the menus and options.

ii. The zoom buttons juts out from the box shaped camera. Designers did not take into consideration that having this one button jut out from the camera made that button extremely vulnerable to breaking. A redesigned could have created a zoom and an un-zoom button would not jut out.

iii. Camera slides open without turning on. Designers did not take into considerations that by sliding the camera lens open meant turning on the camera. The intuitive nature of the camera is impacted by this.

**Part 2**

I conducted a survey on the usability of the VISTA operating system as compared to other systems. I asked each of the three people what were their most hated features or problems concerning the VISTA operating system. Here are their responses:

Person 1:
1) User Access Control that always popped up.
2) Backwards compatibility issues with older software
3) Issues regarding VPN and wireless networking

Person 2:
1) No built in video Codec
2) Compatibility issues with older software
3) Completely new user interface that was unlike any other Microsoft product

Person 3:
1) New interface was confusing to understand and use
2) Slow on his older computer
3) Did not enjoy the new start menu

From this I understood and share many of the complaints that users had with VISTA operating system. First, it did not build upon successful existing interfaces that Microsoft developed in prior operating systems. This single flaw resulted in complaints about the start menu being confusing and also lacking of video codec which came standard in XP. In the name of security, Microsoft added the user access control without much testing. Unknowingly, millions of users had to waste their time clicking to verify the execution of simple tasks and programs. Users familiar with older operating systems (everyone that has used windows) were greatly annoyed by its bulky Windows defender concepts which also affected VPN and networking capabilities earlier established by Microsoft XP. Interestingly, many businesses are also not switching from XP to VISTA despite warnings from Microsoft that support for XP will soon be phased out. This tells me that people in the corporate world, many who are less technology oriented than computer scientists, are unwilling to transition to a more complex systems. Instead, simplicity
and ease of use should always be a priority when designing features for a wide array of the world’s population

**Part 3**

The program Below captured time data between user inputs and also displayed if the user entered correct data on sheet 1 (the one the user sees). The user input and time for each iteration is stored on sheet 2 which the user cannot see. This is what it itself done in Microsoft Excel using VBA macro.

```vba
Public Sub TimeIt()
    Dim counter As Integer
    counter = 1
    Do
        Dim vStartTime As Date
        Dim a
        vStartTime = Time
        a = InputBox(Prompt:="Please enter the last 8 digits of the alphabet backwards", Title:="none")
        Sheet2.Activate
        ActiveCell.Value = a
        ActiveCell.Offset(0, 1).Activate
        ActiveCell.Value = Time - vStartTime
        ActiveCell.Offset(1, -1).Activate
        Sheet1.Activate
        If a = "zyxwvuts" Then
            ActiveCell.Value = "Right!"
        Else
            ActiveCell.Value = "Wrong!"
        End If
        ActiveCell.Offset(1, 0).Activate
        counter = counter + 1
    Loop Until counter = 21
End Sub
```
VBA macro

Code:

User Sees this:

Data Stored:
Plot Data:

![Plot Data](image-url)

Series 2

Series 1

Power (Series 1)
From this data we can see that the learning curve was about five iterations before users memorized the pattern. This plot is very close to the predicted outcome which is shown with the power trend line which shows that $T_n = T_1 \cdot n^{(-\alpha)}$ is true.

They also stopped reading the prompt after about three iterations knowing that the prompt will not change. Also, initially the user used his mouse to click on the OK button, but soon resorted using the enter button intuitively. One of the more interesting methods the user first used to remember the alphabet was to write it out first forwards and then copy it visually backwards. After that, he tried singing in pairs of three: uvw xyz as taught in the alphabet song and then reversing their order.

**Part 4**

A) Using Hicks Law ($RT = a + b \cdot \log_2(n)$) we can see that a and b are empirical values based upon time it takes to search through a list. Because part a assumes that the user know what he/she is looking for, the only time that is really calculated would be the time it takes for her to move through the 12 item to see which one she needs. Thus, time would be $RT = \log_2(12)$. The solution to that comes to equal $RT = 3.585$ seconds.

B) Using percentages:
   a. Assuming a dynamic list populates things that she needs on top of the list, the time is reduced when dynamic lists are incorporated (dynamic list being things the user knows are exactly where they are and that the user must only choose among static choices). 50/50 would amount to $\log_2(6) = 2.58$, 75/25 would amount to $\log_2(3) = 1.58$ and 90/10 equals $\log_2(1.2) = .263$. This shows that with more dynamic choices, the time it takes to come to react can be greatly reduced.

   The minimum choice time would be when the entire list is dynamic and that first menu item is the one that the user would select every time.

   From this we can derive that the maximum time that it takes for the user to react would be when the item is placed last in the list of 12 items. This means that the user would have to scroll through all 11 additional options before arriving at option 12, the desired one. Therefore, the distribution would be 0/100

   c) From online research, it is suggested that Hick’s law does not apply when the list too lengthy. If the items are not intuitive, the difference between choosing among 500 and 5000 items cannot be calculated effectively since the user may simply stumble and choose nothing.