HCI CS6750
Assignment P2

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1 QUESTION 1

1.1 Tasks Performed

For a one hour period during the week, I performed the following tasks in Table 1.

Table 1 — List of tasks and associated goals, interface, and object

Task	Goal	Interface	Object
Start a load of laundry	Wash cloths such that my family and I have clean clothes for the week	Top load washing machine with knobs and buttons for power and wash settings. Laundry detergent and stain spray	Samsung washing machine
Attend a customer meeting for work virtually	Gather customer requirements for new implementation	Internet connection with meeting interface. Buttons to mute, turn on/off video, and disconnect from meeting. Chat window to enter messages. Mouse is used to control clicks	Google Meeting
Check work email	Get updated information for work related things	Internet connection with email interface. Buttons to compose email, textbox to search for email, and folders to search for filtered emails	Google Email
Watch TV	Personal entertainment for recent sports	TV with Amazon Fire Stick. Controller with buttons to adjust volume, search for programming, and power on/off the tv and Fire Stick	LG TV
Print Tax documents	Have hard copy of tax documents	Printer with paper tray, and ink	Brother printer

1.2 Level of Directness and Invisibility

Table 2 — Level of directness and invisibility of the tasks from 1.1

Task	Level Of Directness	Level of Invisibility
Start a load of laundry	This is a relatively high level of directness. Early in my childhood, I learned knobs were for turning and buttons were for pressing. Once the washing machine is loaded, selecting the wash cycle, temperature, and spin speeds is predetermined by the choosing one of the preprogrammed wash cycles. The start button is in the center, making it clear and easy to access.	The level of invisibility is not high, nor is it too low. I must think about what I am washing (whites, delicates, bedding, etc.) and, as a result, select the correct cycle by turning the knob so that the light is next to the preprogramed wash cycle I need to use. Because of the effective design, and the frequency I use this interface, I am easily able to select this and start the washing machine.
Attend a customer meeting for work virtually	High level of directness. Using my mouse, I must click on only one "JOIN" button to enter a meeting. Once joined, again I use my mouse to click a separate button to enable/disable video, mute/unmute my microphone and a button to end the call. Because of this, the articulatory and semantic distance are neither too large. Once joined, I feel like I am a directly engaged with the meeting, not with the computer or Google Video.	Very high level on invisibility. Joining the meeting in very easy. I press a button and join a room with other meeting attendees. The mute and video buttons are clearly labeled meaning I don't need to think at all about interacting with them. Once in the meeting, I need to spend little to no effort thinking about my interactions with the underlying interface. This is good by Google as I have not used this interface for long
Check work email	High level of directness. Because my company uses the same email and video program, it is very easy to compare the two. Email is organized in folders and ordered chronologically, making it easy to find and read what is needed. I can easily compose an email clicking on the "Compose" button. The blank email even resembles a letter (in my opinion) one would have written on prior to email.	High level of invisibility. Because of how common email is, it does not feel at all like I need to think about my interaction with the email interface. Rather, it feels like I am writing a letter to a group/individual to share the information that is relevant to the emails subject. Because of the frequency I use this, and the length of time I have been using email overall, there is very little thought that goes into the interface itself.
Watch TV	Medium level of directness. Here I am interacting with a streaming device using a remote with buttons. I must consciously look at the remote to confirm I am pressing the correct buttons. Because of this, direct engagement is lessened. Also, because I don't know my way around the Fire Stick UI all that well, my cognitive load is a bit higher.	High level of invisibility. While the streaming device is another piece of hardware connected to the TV, it does not feel like I am interacting with it. Rather, it feels like a normal interaction with a cable TV, and this I have been using for a long time.

2 QUESTION 2

As an avid coffee drinking and person who welcomes instant gratification, I use a Keurig coffee pot quite often. It's the perfect vehicle for an almost instant cup of coffee that doesn't sacrifice flavor for convenience. As such, the components interacted with are 5 buttons to select the amount of coffee brewed from 4oz to 12oz, a button for temperature settings, and a button for strength, 3 buttons for saved brewing preferences, a button to start the brewer, and lastly a power button. Additionally, there is a vessel which holds the Keurig coffee pod and a removable reservoir to hold the water.

At one time, after first purchasing, I really had to focus more on the interface of the Keurig than the task of using it to make a cup of coffee. Which buttons to press for cup size, which button to adjust temperature, etc. Having used this Keurig model for over a year now, I focus less on the interface as I know where all the buttons are and the order in which they need to be pressed. This is mostly because all Keurig's behave similarly, though buttons are commonly in different places depending on the model. Moreover, the time I spend now focusing on the interface has been minimized because the process from beginning to end involves very few button presses – at a minimum 2 and 4 to 5 if adjusting temperature and/or strength.

If I were to suggest a design or redesign to the computational interface that would get me to the point of invisibility more quickly, I would look for some type of bulk coffee pod storage that would load and unload the pods itself, without me needing to manually do it each time. Because this is a necessary step for every cup of coffee made, this improvement would move the level of invisibility in the direction of feeling like I am interacting with the interface even less and with the task more.

3 QUESTION 3

For this question, my answers will analyze three types of human perception a user would experience using a diet-tracking application to track daily caloric intake. The three perceptions are visual, auditory, and haptic

3.1 Human Perception Feedback

I have used an app called RP, developed by Renaissance Periodization, for many years. The app tracks macro nutrients, like calories, to help assist its users with weight loss, weight maintenance, and muscle gain. The interface the user interacts with has you start by entering some standard information – sex, height, weight, body type, and weight goals. Based on the information provided, the app generates an eating plan for the user to reach their goals. Each of the three types of human perception are employed in the following ways:

3.1.1 *Visual*

Visual feedback is the predominant method of feedback this ap. Most noticeable to the user is where the user would go to track the progress being made. To track this progress, the user enters their weight on selected weight-in days, typically two or three times a week. The app then provides a graph with a dotted green line representing the projected path the user should be on in the journey. Weight loss slops down, maintenance is linear, and muscle gain would slop upward. Ideally, the user's weight, shown as a blue dotted line, would move in a parallel direction to the green line. This visual feedback from the app tells the user whether they are meeting their goals and will suggest changes to daily macros based on where the blue line is when compared to the green line. If below the line, the user is progressing in the correct direction, and an increase in macros would be suggested. If the blue weigh-in line is above the green line, a reduction in macros would be suggested to get the user back on track.

3.1.2 *Auditory*

Auditory feedback is present in the RP app via Podcasts. Users of the app have access to material covering topics like diet plateaus, holiday eating, and even podcasts produced by individual diet coaches. Aside from this, there is no auditory feedback for the user within the app.

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3.1.3 *Haptic*

There is no haptic feedback for users within this app.

3.2 Improving Human Perception Feedback

All apps, regardless of the device, have a direct connection with the user. Taking input from the user in the form of biometrics, individual meals, and work out schedules, the app computes the users suggested baseline macros and adjusts as needed depending on progress being made. The app outputs the user's progression toward their goal on a graph. Specific to the RP app, I think human perception feedback could be improved in the following ways:

3.2.1 *Visual*

The app does a good job visually of keeping the user informed with what they are doing right/wrong. The buttons used to interact with the app are big and bright, making it clear what each one does. Entering meals is done using a sliding button to increase/decrease the amount of food per meal. If the user enters too much of one macro, the app shows you where you have gone over. When entering individual macros, it can sometime be tricky to know if the weight of the food should be cooked vs uncooked, peeled vs unpeeled, etc. As an example, if entering a banana, the image shown is that of a banana with a peel. Speaking for myself, I don't eat the peel of banana. As a result, adding 100 grams of banana to meet my carbohydrate goal means I am consuming 100 grams of peeled banana. The amount of banana would be significantly less if I were eating it with the peel. For myself, because I have used the app and know what it wants, I know that peeled is inferred. But, to a first time user, they might eat the banana peel along with the fruit if not informed. Another example is cooked vs uncooked food. Take rice for example. 100 grams of uncooked white rice vs 100 grams of cooked white rice is a huge difference. I have found that after cooking, rice is about 3 times heavier than its uncooked equivalent. Here again, I know that the app wants me to weight cooked rice as that is what I am eating. But, for the first time user, this could cause unnecessary confusion and impede on their progress. Visual improvement would be in the description of the food and associated image. Instead of "banana" or "white rice", the app should display "peeled banana" or "cooked white rice".

3.2.2 *Auditory*

Aside from the podcasts, there is not a lot of auditory feedback. This is a human perception that is underutilized, in my opinion. My belief is that the app could incorporate some time of audible sound into both positive and negative feedback. When saving meals, if the user is above or below the allotted macros, a short sound could be used to warn the user they are about to save a meal that does not meet their daily needs. Finally, I think a congratulatory sound should be played once the user reaches their goal. Whether the goal is muscle gain, or weight loss, after a 6-12 week cut/bulk, it would be appropriate to congratulate the user with the sound of an audience cheering and applauding the user for meeting their goal.

3.2.3 *Haptic*

One of the tasks I find most difficult in the app is the slider used to increase/decrease amounts of food which are apart of a meal. For example, if I need 50 grams of protein for breakfast, I might have 100 grams of turkey bacon and 70 grams of egg whites to account for the 50 grams of protein. To enter this, I have to add turkey bacon and egg whites to my meal. Once added, there is a slider used to enter the foods weight. It can be difficult to get 100 grams or 70 grams exactly. Instead, I enter 75 grams or 95 grams and end up short/over my protein goals. Instead, the app could incorporate a haptic that confirms the user has reached the goal amount for that macro. This could be a short vibration or burst type vibration. Once the user feels the vibration, they know the goal amount of protein/carbs/fats is met and no longer needs attention. The user can then move onto addressing the next macro, be it carbohydrates or fats.

3.3 One Additional Human Perception

Taste: Being that RP is a diet tracking app, there is a lot of food related input. The user can select from a database of foods, all of which are accompanied by an image of the food. If not in the apps database, custom entries can be made and saved for later user. For me, I generally build my meal before starting the cooking process, so I know what and how much I need to prepare. Doing this often gives me that mouthwatering feeling and, at times, I can taste the food well before cooking the food. Another improvement, related to taste, might be an explanation of food flavor. The database of food offered in the app is vast, and

some of the foods I have never even heard of. If I was interested in knowing a little bit more about it, including what it tastes like, there could be a mouth icon, question mark icon, or info button that I could press to deliver this information. This would help when pairing foods.

4 QUESTION 4

4.1 Multiple Modalities

Dishwashers are not supposed to be difficult machines we interface with. The dishwasher in my house has a set of buttons on the top of the door where the user can select the wash type, drying type, and start/resume a dishwashing cycle. When starting the dishwasher cycles, pressing the START button results in small screen displaying a countdown from 5 seconds. You must close the dishwasher in this amount of time, else the dishwasher will not start. This is understandable as starting the dishwasher with the door not closed correctly could be disastrous. However, there is no feedback from the dishwasher if the cycle does not start. Moreover, because this particular dishwasher is so quiet, it is hard to know if it is actually running. There really is no feedback given to let the user, me, know that the dishwasher has started.

To improve the dishwasher interface, there should be some type of audible alarm that lets the user know the countdown to start or resume the cycle was initiated, but the dishwasher was unable to start the cycle because the door was not closed all the way. Alternatively, when the countdown has been initiated and the door is closed correctly, a different sound could be played to inform the user that everything is okay for the dishwasher to start washing.

4.2 Offload Tasks

When logging into Windows on my laptop, the default method of authentication is facial recognition using its built in webcam. Alternatively, I can use my fingerprint, a pin, or a password. To use one of these, I must wait a few seconds once Windows has begun looking for my face, click a "Other sign-on" button, and then select the method I want to use. When using my laptop with the screen open, this is not an issue. I want to use facial recognition as this takes the task of entering a pin or password away from me the user. However, I do not have my

laptop top open when on a docking station. Despite the laptop not being open, Windows still defaults to using my face for authentication. To ultimately login to Windows, I must click the "Other sign-in" button every time and select from one of the other authentication methods.   This interface clearly violates the tip of offloading tasks because it makes me perform more tasks and increases the amount of time it takes to sign into

To improve this interface, the laptop should not use facial recognition to login when the lid is closed. Instead of having to wait for the "Other sign-in" button to present itself, click on it, and then choose the type of authentication I want to use, the laptop should just go directly to entering the pin.