

# Assignment P2

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## 1 QUESTION 1

### 1.1 Task List

Task	Goal	Interface	Object
Brushing Teeth	To have clean teeth	Electric Toothbrush	Teeth
Logging in to computer	Successfully log into work PC	Keyboard	Computer
Reading Kindle	Finish a chapter in my book	Screen	Object
Changing temperature on thermostat for AC	Making it cooler in my house	AC thermostat	Air conditioner
Taking a shower	Be clean and refreshed	Shower head and temperature control	Shower

*Table 1* — List of tasks performed in an hour of focus

### 1.2 Directness

#### 1.2.1 *Brushing Teeth*

When it comes to brushing my teeth, I use an electric toothbrush, which takes some of the directedness off of me, and puts it on the toothbrush. Because of the automation of the toothbrush, some of the cognitive load is taken off of me, because I can rely on the efficiency of the toothbrush to make sure it cleans my teeth. All that is required of me, is to make sure that there is toothpaste on the brush, and that I move the brush into all the areas of my mouth. The toothbrush also changed vibration throughout the cycle, alerting me to change zones in my mouth. The process isn't as invisible as others in my list because I am still

controlling the bulk of the process by moving the brush around my mouth, but the toothbrush head is doing the majority of the cleaning.

### ***1.2.2 Logging in to computer***

Logging in to my computer is a pretty invisible process, with just my interaction being that I type in my username and password, and hit enter. From there, my computer runs a logon script, checking my permissions on the network, and logging into shared or mapped drives that I have, as well as a handful of other things I'm unaware of because I'm not sys admin. With this interface being as invisible as it is, I need to spend next to no time at all focusing on what I need to do to actually log in to my computer, because all of the work is done behind the scenes. This makes it so I spend only the time I need to on the interface, but not on the actual task at hand. The distance from my interaction with the object is small, and so I feel like I am directly logging in to my computer, doing most of the work, but the real work is being handled by the object through the interface

### ***1.2.3 Reading Kindle***

Reading on my kindle is a bit between an invisible process, and direct manipulation. I need to press a button to turn on my kindle, but the invisible process behind that loads my book to the screen, and takes me to the page I left off at. The same goes for turning the page, I press a button, and the next page, or previous page is loaded, depending on the button I press. Through this interaction, I feel as though I am directly interacting with the kindle, because I am pushing buttons to make it do what I want, so the distance, in terms of directness, is quite small. I do barely need to focus on the interface to complete my task as the buttons are placed intuitively, and I only need to focus on them when I'm ready to turn the page, or need to look back at what I previously read, letting me focus on the task at hand rather than the interface I use to get there.

### ***1.2.4 Changing temperature on AC Thermostat***

For this task, I use a thermostat to interact with my air conditioning unit to cool my house down. To me, this feels like direct manipulation. I'm pushing buttons, either an up arrow, or a down arrow, and the feedback from the screen is telling me at what temperature my AC unit will turn on at. If I turn the AC thermostat down enough, an LED on the thermostat will start blinking to inform me that the unit is turning on and to expect to be cooled. The directedness

from the object (thermostat) to the object of the interaction is close, but it feels like the distance for me is quite large in that I'm only pushing a button to get my AC to turn on or off. This task is mostly invisible, it doesn't take very much thought to get my AC to turn on or off, rely on the thermostat to tell it when to and when not to.

The thermostat wasn't always so straightforward though, because it has other switches that are needed to be turned on in order for the AC to work. My AC unit is called an evaporative cooler, a pump pumps water to pads, and a fan then uses those wet pads to push the cold air into the house, and unless the pump and fan are running together, the house won't get cooler. This can be challenging to someone who has never used an evaporative cooler before because they might not know they have to use both the pump and the fan, or what settings those need to be at for optimal cooling.

## **2 QUESTION 2 – MOUNTAIN BIKING**

A task that I do frequently that at first required a lot of thinking about before getting good at it through time, and trial and error, is mountain biking. This isn't to say that I don't put a lot of mental energy towards not wrecking while I'm out mountain biking, but the interface I interact with while mountain biking has become much more automatic.

### **2.1 Components**

My mountain bike is setup with front and rear brakes, each through a different lever, a forward gear selector and rear gear selector, giving a total of 27 gears for me to select from, as well as a dropper post used for raising and lowering my seat position when biking. I also have what are called "clipless" pedals which are poorly named pedals that my shoes clip in to.

### **2.2 Learning through doing**

When I first began mountain biking, I did so on a bike that only had 4 of the 6 components listed above, that being the gear selectors and the brakes. Of course, I had pedals, but they were the simple flat pedals that required next to no thought to use. When first starting out, I had to focus much of my attention to making sure I was in the correct gears for climbing long hills, climbing small hills or going down short hills or long hills. Along with that, I also had to focus on being

in the correct gear for boulders that would come up along a trail, because suddenly having to power through a large boulder after being in a hard gear for downhill is a rough position to be in, and you can pop your chain off if you aren't careful. Now that I'm a more experienced biker, I am able to change gears without looking at the selectors, instead flicking my thumb while maintaining focus on the trails because I've learned through feeling out the bike, and repetition, where I want the gear to be and how to get there.

Braking can have a major impact on mountain biking, and learning when and how to brake is a learned skill, one that I'm still mastering. When it comes to braking, you want to make sure you apply enough pressure to the brake levers as to not flip the bike by applying too much front brake, and skip out your back tire unintentionally by using too much front brake. Also, learning to control a panic situation to where you aren't panic braking which could lead to a crash instead of avoiding one. At first, I would instinctually hammer on both brakes when I needed to slow down, trying to get there as fast as possible to avoid panicking as I slowed, but through experience, and focusing on braking techniques, I'm not better able to learn forward or backwards, depending on the situation, to better apply braking to the forward or rear wheels to control the slowing. The dropper post I mentioned above is also quite useful for braking, lowering the seat allows me to brake harder during downhills with less of a risk of flying over my handlebars, something that took some time and practice to master.

### **2.3 Computation Interface**

One such computation interface that could improve mountain biking that I don't employ, is that of a speedometer, but to take it a little bit further, adding on a pressure sensor for the front and rear brakes to output how much pressure I am applying to get a better idea about how my brake pressure through the lever is being applied to the brakes to see if I could better tune when and how hard I'm braking. A visual output of the gears, both front and rear at the center of my attention rather than off to where my hands are could help me determine a more refined gear to be in depending on the terrain I'm riding.

### 3 QUESTION 3 – INFANT DISCOVERY TOY

#### 3.1 Toy Feedback

An infant toy is designed to provide feedback that a baby can see, hear and touch. One such toy is Spin and Learn Color flashlight by Vtech.



*Figure 1*—Spin and Learn Color flashlight by VTech

This toy makes noise when you push any of the buttons, the flashlight can light up for a few seconds or stay on if the top button remains pressed, and has a color selector in the light that you can change by spinning the dome of the light. When spinning the light to select the color, a voice sounds telling which color is selected, and the flashlight lights up that color.

#### 3.2 Toy lacking auditory and haptic feedback

One such toy for kids that are lacking in auditory feedback are kids Lego Duplo's. Duplo's are Lego's that are larger than regular Lego's so that they are easier to build for toddlers and help with hand eye coordination, as well as experimenting with building new ideas through testing their experiments. From personal experience I think that Duplo's could use a more auditory and haptic feedback to let kids know that the connection was a successful one. Something as simple as a click, to provide both the feeling, and the sound of the two pieces coming together could let the child know that the pieces are correctly joined and now a solid piece.

### **3.3 Toy lacking visual feedback**

This one is tougher in the realm of kid's toys, as visual feedback is a very pronounced feature when it comes to kid's toys. One toy that comes to mind that is in the same domain is a power wheels vehicle. The visual feedback that would be useful for these would be a light showing that the battery is connected, or a gauge that displays the charge left in the battery, or a close estimate. Also something that could be useful is a speedometer to show how fast the vehicle is moving.

### **3.4 Additional senses**

A good sense that could be added to a child's toy could be the ability to feel a pressure feedback, or change the feedback to the child as a different pressure is applied. A toy that this could be applicable could be something that makes noise, like a keyboard. The keyboard could change the sound level depending on how hard the child applied pressure to the keys. Another use for a pressure sensitive toy could be a stuffed animal that responds to how hard it is being hugged.

## **4 QUESTION 4**

### **4.1 Giving the users control of the pace**

One interface that I use regularly for my job is an online educational tool used to teach hospital regulation, security regulation and other such needed education to keep up current at work. This interface has timed modules that we can select to launch and provide the education needed to pass the test at the end of the lecture.

The interface is fairly simple to use, clicking next buttons, or selecting links on the screen to launch additional content that drives the point home. Where it fails in giving users the control to set the pace of the class comes in when we're required to have the instructions up for a certain amount of time, regardless of whether the timer has reached zero or not. It's possible to speed up the video for the lecture, or to choose to read the material instead of watching the video, but even if we finished reading ahead of schedule, or increase the speed of the video, the page won't allow us to move forward unless we've been on the page for a set amount of time, usually the time it would take the video to play at its regular speed.

To redesign this interface, I would tie the time it takes to watch the video at whatever speed to when the button becomes available to access the next page, or next training module. If a user decided to read the material instead of watch the video, then I would design the interface to allow for the next button to become immediately available as there is no way to time how long someone takes to read the material, and it's wasting the users and companies time relying on a hard-coded timer to access the rest of the maters.

#### 4.2 Emphasizing essential content while minimizing clutter

A piece of software that I use for work is an interface integration tool that allows plain text messages or other types data out of one application, to then interface with another or many other applications at the same time, essentially, it's a bridge between applications to share information. The piece of software is called Cloverleaf, and over-all is a very nice and well put together application, but it does come with clutter due to the number of jobs it can perform.

An instance of Cloverleaf not emphasizing its essential content to minimize clutter comes from its protocol ribbon (figure 2)

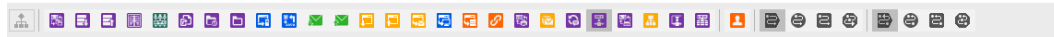


Figure 2 — Cloverleaf protocol ribbon

This protocol ribbon is cluttered with types of protocols you can use between application to send information, but rather than focusing on the most commonly used i.e., FTP, SFTP, TCP/IP, it instead displays every type of protocol you could use.

A better design would be to allow the user to customize this ribbon, either when you set up the application, or when the user has gotten a chance to know what communication protocols are most widely used in the job they are performing, though a customize screen. This customization screen could be something as complicated a drag and drop option to add/remove the buttons, or a category list that the user is able to select and add or remove. This type of customization would enable more screen space to enlarge the buttons to more easily recognize them, or more screen real-estate for the rest of the application. Something like this would also cut down on the need to search for the right protocol to use

because the available list is smaller, allowing the user to quickly find the icon they are looking for and most commonly use.