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Assignment #3: Human-Computer Interaction

Universal Principles of Design & Dark Designs/Digital Addiction

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Universal Principles of Design

Products

Desire2Learn

The first product is an online portal that all MSU students use called Desire2Learn, or D2L. This platform is used by the students to access course-related material for their enrolled classes. The platform offers many different capabilities. Students can access course-related material such as lecture slides or assignments. Students may also take online quizzes and submit assignments. The platform also allows students to converse through discussion boards and forums. It is the “town square” for all MSU course-related online needs.

Siri

The next system I would like to address is Siri. Siri is a virtual assistant provided on Apple products. The system can be used to assist users to complete many basic tasks. I personally use Siri to send text messages, make phone calls and create reminders. Siri can also be used to search the web and compute math problems. Interestingly Siri can actually calculate very complicated mathematical problems. For example, Siri can graph multivariable equations.

Discord

Discord is an instant messaging and social media platform. It is used to create communities through the use of “servers”. The application allows for discussion groups, making voice calls, and sending private messages. The primary use case for which I use Discord is to communicate through the University maintained server for Computer Science students. Discord grew in popularity through the gaming community. Allowing gamers to create spaces to chat and share ideas. Discord can be used for any number of reasons where online community interaction is desired.

Wells Fargo Mobile App

The next product I would like to address is the Well Fargo mobile banking app. This app is used to provide banking interactions mobility. I primarily use the app to pay my credit card statement each month, but there are many other use cases. The app allows users to transfer

money between accounts, check transaction history, and view billing statements. Another useful use case that the developers have features is the ability to locate nearby ATMs.

E-Collar Remote

I have a hunting dog that wears an electronic collar for training and fieldwork. The reason that this product is so important is that oftentimes in the field, my dog is far far away. Possibly across a field or river where vocal commands cannot be heard. The collar allows me to signal the dog by making a “beep” sound. A short duration of the beeping sound means that he is going in the wrong direction and a long beep means that he needs to turn around. I personally use the collar for training purposes, but other have used collars to maintain control of their animal while off-leash. I do not see a need for this use case because my dog is very well trained. But some people shock their dog to prevent bad behavior. I love my dog, so I do not use it in this manner.

Apple Mouse

I have a MacBook Pro laptop that I use for school, but when I am not in the classroom, I prefer to use the Apple mouse for comfort. The mouse is connected to the computer via Bluetooth and I find this device more user-friendly for navigating my computer than the provided trackpad located on the hardware of the laptop. I have found that using a mouse provides more precision and more efficient navigation. Some users like artist require this precision over that provided via a trackpad. Additionally, although the Apple mouse is not made for gaming, PC gamers prefer a mouse for increased precision as well.

Applying the Universal Principles of Design

Aesthetic-Usability Effect

The first of the Universal Principles of Design is Aesthetic-Usability Effect. This principle refers to a user's subjective tendency to associate the usability of a product with a visually attractive design. Commonly beautiful-looking products are preferred over usable-but-not-beautiful ones.

Aesthetic-Usability Effect: Product Design Violation

The remote control for the e-collar for my dog is very sleek and clean. There is a screen on the front that provides details about the current setting of the collar and the battery level. To use the remote and collar there are two buttons located at the top of the remote. These buttons are flush with the apparatus and feel study. The problem with this design is that there is no indicator for which button produces which actions. Through mistakes of my own, I have learned the hard way which button does which. The button on the left beeps the collar with a sound, and the button on the right shocks the dog with an electrostatic pulse. Because there is minimal

distinction between each of these buttons, I had often confused them. This clean and aesthetic design looks nice but leads to much dissatisfaction.

Applying Aesthetic-Usability Effect to E-Collar

I would apply the UPD principle of the Aesthetic-Usability Effect to improve the user experience by adding some form of indicator to these buttons. On other remotes that I have seen, the button to provide a static shock is protruded and the sound activation button is flush. This provided a distinct difference between the two button options.

Accelerators

As a student in Computer Science or a professional in any concentration, it is highly desirable to maximize efficiency when working with development tools/systems. When working to complete a task, it is ideal to pursue the shortest path. For example, let's examine the task of 'copy & paste' a snippet of text. The average user would know that highlighting and selecting the desired content and 'right-clicking' would provide a dropdown menu option to 'copy' and then 'paste'. But, this is not the shortest path to complete said task. A shortcut exists to increase time efficiency. A knowledgeable user would know that the key combination 'ctrl+c' and 'ctrl+v' performs an identical operation with fewer input steps taken by the user. This under-the-cover operation is known as an Accelerator. These shortcuts may go unseen by the novice user, but they allow experienced users to tailor frequent actions.

Accelerators: Product Design Violation

The product that violates this design principle is D2L. One of the most common attributes of any effective website is a search engine. Search engines allow users to locate material or content by inputting related keywords. Without the use of a search feature, users must navigate to the best of their ability throughout the site to locate what it is they are looking for.

Applying Accelerators to D2L

To improve a user's interaction with this product, I would recommend adding search engine capabilities. Addin a simple text input in the top navigation bar where users can input text keywords and search certain criteria. This would act as an accelerator by allowing users to quickly locate desired material.

Affordance

When designing a product a minimum level of a user's previous knowledge is assumed. Everybody knows how a door operates. Often, the door swings in one direction to be opened and the opposite to be closed. The orientation of furniture attached to a door, let's say the handle, distinctly dictates strong clues to the user about which direction this operation should take place. If a door is to be pushed, the furniture is open flat, and if the door is to be pulled then there is a

gripped handle indicating this operation. The property of an object that strongly suggests to the user how a product should be used is known as Affordance.

Affordance: Product Design Violation

The product that violated this design is the Apple mouse. On traditional mice, there is a specific button for each action. There is typically a left button for 'left-click', a right button for 'right-click', and a scroll wheel to scroll the window up and down. Apple has decided to do away with all of its buttons and make the top surface of their mouse one giant touch sensor. This removes the apparent nature that a traditional mouse provides. There is no certainty for which area of the mouse is the left or right side to click.

Applying Affordance to Apple Mouse

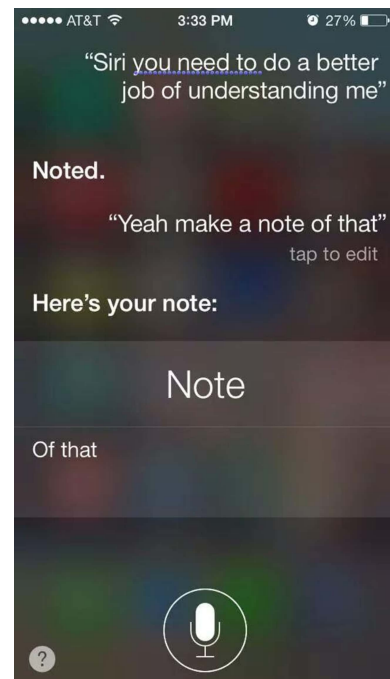
I would suggest to Apple to add some sort of indicator on their mouse to provide an increased user experience. Maybe something as simple as a line showing the user which region of the mouse is for clicking and which is for scrolling. When looking at the mouse, it is evident that the design principle of affordance is not present whatsoever. A slight appearance change would drastically enhance the user's experience.

Anthropomorphism

It has been well documented that the human condition prefers 'things' that are familiar-looking. What better way to achieve this than to make objects reflect human characteristics. Anthropomorphism is the design principle that suggests giving a product human-like features to increase a user's perceived expectations.

Anthropomorphism: Product Design Violation

The product that I believe violates this design principle is Siri. This virtual assistance is capable of many things. A user can complete the most basic operations with the use of Siri. One could say, "Siri, text River I want to hang out" and Siri will do exactly that. Siri will even talk back to you and say something like, "Are you ready to send this", to which you respond, "yes" and the message is sent. This back-and-forth interaction leads the user to believe that the virtual assistant is understanding the entirety of the conversation. This leads to the overconfidence of what the virtual assistant is capable of. For example, see the image on the right. In fact, Siri is unable to understand the totality of a conversation.



Applying Anthropomorphism to Siri

To improve the user interaction by applying an anthropomorphism design that more closely aligns with Siri's capabilities. I would suggest limiting the satirical feedback Siri sometimes responds with. This would in turn provide the user with a more accurate understanding of what the virtual assistant is capable of. Although Siri's answer may be fun at times, her competence in completing tasks is limited, for now.

Chunking

Humans prefer to make quick and easy decisions. It is often difficult to remember abundant information in short-term memory. Limiting the quantity of information required to digest has been shown to improve attractiveness. Chunking refers to a unit of information in short-term memory.

Chunking: Product Design Violation

The product that I believe violates this design principle is the Wells Fargo banking app. The opening page of the application is all fine and well. It shows you a basic overview of your accounts, the main reason needed for that app. The chunking design flaw is prevalent in the menu for navigating the app. The list of menu items seems endless.

Applying Chunking to the Wells Fargo Mobile App

To improve the user's experience by applying chunking to the menu navigation. Limiting the number of options a user has to pick from will overall improve the user interaction.

Color Psychology

It may go unnoticed why the food chain restaurant down the street has chosen to paint the exterior or interior walls the color that they did. In fact, lots of time and money has been spent in determining the exact shade of color that was painted. This is known as Color Psychology. In every culture, certain colors are associated with specific emotional reactions. So the walls of your favorite restaurant may be that color because they want you to feel a certain way. Maybe they want you to feel healthy and peaceful.

Color Psychology: Product Design Violation

The product that I believe violates this design principle is Discord. Recently, a new color palette has emerged in popularity called the "Dark Theme". macOS featured it in a software release a few years back. Traditionally the base color for application background was the color white. The new Dark Theme took on the base background color of black. Many other systems have also adopted this feature, such as Github. The idea is that the dark background contrast is easier on users' eyes. In my opinion, it makes viewing content harder to do, white text on a black background is not my preference. We also learned in the lecture that the color black has certain

emotional associations. We learned specifically that the color black has negative emotional correlations.

Applying Color Psychology to Discord

The problem with discord is that it does not allow the user to set this preference. To improve the user's experience by applying the Color Psychology design principle, I would suggest making this a preferred option that the user can make. As we have learned, cultures have certain connotations to certain colors. Allowing users to set the appearance of the background would give a more appealing look to users and improve users' experience.

Common Fate

It may go without saying that humans are not attracted to chaos. We like things to be reasonable and orderly. Common Fate design principle refers to how humans group certain elements. You want certain display information grouped together where similarity is perceived to be related.

Common Fate: Product Design Violation

The product that violates this design principle is the Wells Fargo mobile banking app. The app offers many different options in its menu navigation. But the options are not organized by any relating context. There seems to be a long list of options.

Applying Common Fate to the Wells Fargo Banking App

By using affordance, the operations that the app provides the user should be grouped together. For example, all features related to user cards should be near each other. Features that are related to accounts, such as deposits and transfers should be grouped together. Applying Common Fate to the design of the mobile app will over improve the user's interaction with the platform.

Consistency

As previously stated, humans have been conditioned to expect similarities. If each product you use has similar components, users can interact with each other without having to learn each individual product's operations. Consistency is all about maintaining similarities in your design the that of other products.

Consistency: Product Design Violation

The product that violates this design principle is D2L. In most commonly used services where content is divided into sections. When navigating to a subsection, or the child content of a section, there are often times indicators that a user is viewing the subsection. One common practice is the use of breadcrumbs. D2L does use breadcrumbs within the content portion of a

course subsection. But, in my opinion, the division of top-level content is not made clear. That is when viewing a specific course section, the user is actually one level below the top-level or the home page. To me, this poses unclear actions if I want to navigate to another course.

Applying Consistency to D2L

To improve the user's experience with D2L by applying the design principle of Consistency, I would propose reorganizing the navigation bar such that the substructure of course is more clear. I think that Discord does a good job at accomplishing this by having the topmost nav option in the hierarchy on the right and then moving left each nav for the child subsection. Discord is not the only application platform that does this, many others do too. If D2L were to reorganize the navigation structure to be more consistent with other popular platforms, I believe users would have an improved experience.

Digital Addiction & Dark Designs

The software that has a Dark Design and leads to Digital Addiction is Tiktok. Also, the largest and fastest-growing mobile phone application to date. Tiktok is a social media platform that allows users to share short videos with others on the platform. Unlike previous social media platforms where a user's feed of content was based on what they subscribe to, Tiktok shows content to a broad spectrum of audiences regardless of a user's selected preferences. Then, Tiktok has a unique algorithm that determines the type of content a user prefers, based on how long they watch a video and if they interact and shows them more related content. According to Wallaroo Media,

“As we mentioned, we estimate that TikTok has about 80 million monthly active users in the United States. 60% are female, 40% are male. 60% are between the ages of 16-24. 26% are between the ages 25-44. 80% are between the ages 16-34. This data comes straight from TikTok.”

(“TikTok Statistics - Everything You Need to Know [Mar 2022 Update]”)

I would conclude that the target audience is people who have a job and do not have dependents. Most likely between the ages of 16 and 24. The reason for this argument is that this demographic has disposable income and does not have high risks for spending money. Younger crowds of people do not and income and therefore do not have money to spend. And those who are older, typically have families and therefore must spend their money more wisely, like buying groceries for their family and not on advertisements seen online. This gets me to Tiktok's business model.

The Tiktok business model is much like other giant tech platforms on the internet today, selling user data to advertisers and displaying ads for revenue. This business model incentivizes users to be addicted because it is free for the user. This means that there is no start-up fee or barrier for a user to join. There is little to no commitment. To join, all a user has to do is create an account the begin scrolling. That's all it takes for the beginning of a user's addiction to this platform.

Nir Eyal's Hooked Cycle

Internal Trigger

The internal trigger that the product provides is immediate entertainment. The human condition has grown the need to constantly be occupied. Need something mindless to do while going to the bathroom? Tiktok is as easy as scrolling on your phone. You can do that while sitting on the toilet. Heck, waiting for 30-seconds for the red light to turn green at an intersection? Boring!! Why not open your phone and be entertained for that time. Its only takes a few clicks to enjoy immediate satisfaction. And yes, I have seen this happen before.

External Trigger

I believe that the greatest external trigger that has developed through the growth of this app is the popularity itself. I have noticed that entire interactions between friends in social settings revolve around what was seen on the Tiktok app. Even when you are not using the app, everyone around you is talking about it. This external trigger causes people to be reminded of it.

Action

The typical user interaction is very simple, but this is also the primary reason for the success of the app. Because the operations to use the app are so simple, the user is rewarded almost instantaneously for little to no effort at all. To use that app a user will open the app and begin scrolling. Videos will appear and the user will choose to watch the video or scroll on to the next video. If the user enjoys the video they have the option to follow the creator's account, like or share the video. That's it, very simple.

Reward

The dopamine feedback loop is almost instantaneous. We see a video we like, positive emotions are reflected and the user feels good and happy. The human condition has become so obsessed with constantly being occupied that the slightest moment of inactivity is painful. A user can scroll for 1 minute and be rewarded with entertainment, or the user can scroll for hours on end. The reward of entertainment via this app is limitless. It is evident that going back for more is always an easy option.

Investment

The reason this reward is so significant is that the initial investment is so little. Unlike Facebook or Twitter where the user must read a post, this app allows a user to sit calmly and just watch. No reading is required, that would take too much effort. Just sit back and enjoy. Everyone is capable of making such an investment.

Addiction Algorithm

To determine whether or not a user of Tiktok was addicted to the platform would be determined upon two variables: duration of time using the app and frequency of using the app on a daily basis. I believe that these variables are indicators of addiction because these are the core indicators of habitual habits. If someone does something frequently, then they are addicted. Or, if someone spends hours on end using the app, possibly neglecting other responsibilities, then they are also addicted.

Pseudocode

```
If the number of times opening the app daily averages 5 or
more:
    Return true (they are addicted)
If the weekly average duration using the app is more than 5
hours:
    Return true (they are addicted)
If at least one day a week the app is used for more than 2
hours total:
    Return true (they are addicted)
If TikTok is the most used app on their phone:
    Return true (they are addicted)
Else:
    Return false (not addicted)
```

Assuming that these variables are true indicators for addiction, this is a guarantee for objective determination because we are not asking the user for their opinion on the matter. If you were to ask a user if they had a problem, the most likely answer would be “No, I don't have a problem!!”. Nobody likes to admit that they have a serious problem like an addiction. If they did, then that would conclude that changes would need to be made to address the problem of addiction. These variables and calculations do not factor in the user's opinion. They only examine the cold hard data and determine the addiction outcome based on measurable inputs.

Work Cited

“TikTok Statistics - Everything You Need to Know [Mar 2022 Update].” *Wallaroo Media*, 8

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