Assignment P3

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1 QUESTION 1

1.1 Discoverability

Discoverability refers to the principle that users should be able to discover the features of interface with ease instead of learning with extra cognitive effort. If the interface is not discoverable by the user, the gulf of execution will be enlarged. On the other hand, if the user find it easy to discover the interface features and figure out what actions to take and how to take, the gulf of execution will be minimized by the good discoverability. For example, when user sees a button, they can easily discover them and know right away that they need to press it. The use of signifiers such as icon or other labels will improve the discoverability of the interface and make it eventually invisible. The easiness of discoverability directly affect the gulf of execution as the user don't have to think about what actions to take.

1.2 Simplicity

Simplicity is quite self-explanatory as it refers to how simple the interface can be that the user can still easily understand the features. The design should only contain relevant information and the information that is most often used. As a designer, we should only keep the essentials and remove the irrelevant information which might distract the user. Text content, visual elements or audio elements can be distractions to users sometimes, and it can increase the gulf of execution as the user will be distracted by the noise of information and cannot figure out the actions. To avoid this, we need to maximize the signal to noise ratio by making the design simple and only including the relevant information to make the interface invisible and shorten the gulf of execution.

1.3 Mapping

Mapping refers to the relationship between two sets of things such as mapping the real world and the system. A good mapping between real world and interface will make it easier for user to understand and learn how the interface works. For

example, the heating controls on the stove matches the heating element, which makes it easy to identify which button controls which heating element. The use of mapping principle allows the user to interact with interface like intuitively and thus shorten the gulf of execution. The user don't have to think about what actions to take, instead they understand and know the action to take immediately from the mapping between interface and real-world.

1.4 Equity

Equity means that the design should treat all users equally to help them achieve their goals and the interface should also avoid separation among users. Users may have different levels of expertise or knowledge and some might have disabilities. The design should consider the differences between each user and make it the best for them to fulfill their goals. For example, some interfaces will make the color icon labeled with color text, making it possible for the color-blind people to tell which color they would like to select. Some interfaces also have the design of accessibility to enable people with disability to interact with the interface. For example, some interfaces might have the feature of text reading and voice commands to enable people with hearing or visual disability to use the interface with ease.

1.5 Ease and comfort

The design should also consider the ease and comfort for user experience. Regardless of user's ability, postures or mobility, the design should makes the user interact comfortably and engage the least cognitive load to complete the task regardless of what context they are in. For example, when users are running, the interface should be designed in a way that people can discover and press the button or simply use voice to interact as the physical motion is less accurate in the moving state. Ease and comfort focuses on the user experience in different contexts and might help the user alleviate the mistakes or slips during the interaction.

2 QUESTION 2

ATM is selected as an example of the user errors. The interface have a keypad with 16 keys: 12 keys of number and zero or digit, and 4 keys to cancel, clear, enter transactions. I sometimes make slip errors when I enter the wrong numbers.

Because I am so familiar with the layout of number keys, so I sometimes only focus on the screen while typing in the numbers without conscious attention, and this lack of attention makes me enter the wrong numbers sometimes. Previously when there are no keys beside the screen, I have to shift my eye and attention from the screen to the keyboard to press the numbers and enter the information. I might mistakenly cancel the transactions when I intend to confirm the transaction, and vice versa. The gulf of execution between my attention to the screen and keypad is not very often but the cost might be high if I accidentally enter the wrong number or confirm the wrong transaction. Although the interface will show message of " do you confirm the transaction?", I might still make slip errors of pressing "yes" instead of "no". This is because I focus more on the task rather than the message being prompt. I subconsciously pressed the wrong button automatically because I learnt to use the number keys without much cognitive effort. Another slip and mistake I might encounter is that I insert the card in the wrong direction that the reader cannot read it at all due to the wrong position of the chip.

The penalty associated with it will be high as I may lose money if I mistakenly enter an extra zero to my transferring amount or if I mistakenly confirm a transaction that I did not intend to. If I insert the card in the wrong position, the penalty is also annoying as I might not be able to get my card back.

2.1 Constraints

Constraints are often involved in the design to prevent the slips and mistakes. Physically, this can be done of using shape and size. For example, some people may find it confusing to deposit and withdraw cash from ATM. Some ATM have the same slot for both functions while some do not. If the ATM have two slots for depositing and withdrawing, user might have confusion which slot is the one to perform the action. Two different shape and sized slots can be designed to prevent the slip. The depositing slot can be designed in a smaller size where people can insert cash or envelope directly. The cash withdrawing slot can be designed larger to differentiate from the depositing slot. In addition, they can be placed in separate locations, one closer to user and the other further from user. This can also prevent slip or mistakes.

2.2 Mapping

Mapping can also be involved in the design to achieve less slips and mistakes. When users have to switch attention between information on the screen and keypad, it can be distracting for some users. I sometimes may lose my attention of pressing buttons on keypad when I pay too much attention on the amount number. A mapping of color can be used on the keypad buttons to help user use less cognitive load. A red, yellow and green color can be applied on the cancel, clear, enter buttons. The color mapping should be consistent with other colors used in the keypads and real environment such as traffic light. The traffic light color also involves the three colors used here that represent pass, stop and with caution.

2.3 Affordance

Affordance can be improved in the ATM design to prevent the slips and mistakes. Affordance refers to the relationship between the objects and its user that the object can conform to the user's needs based on their perceptual model and experience. For example, the handle on the door can afford a push or pull from its user. The ATM design may consider the swipe bar instead of card insertion. The swiping bar affords the user to swipe the card, this can prevent the user forgetting the card when they finish the transaction. Also this prevent the user to insert the card in wrong direction and causes trouble of reading.

3 QUESTION 3

3.1 Slip

I like to play temple run when I was in high school and now it can still reminds me of the fun time. Temple run is a game that user needs to escape from the traps, falls, fires and monsters when they are running in the temple. When I play the game for a while, I learned the skills to jump through the traps, slide under the tree hollow, and to turn left or right to avoid the roadblocks. Still sometimes I made some errors when I pay less focus to the road condition. For example, when I continuously jump through a few traps and I instinctively slide up the screen and want to jump through the next trap while actually it's a trap that needs slide down. I know my goal is to pass the trap and I also know I should slide down to pass a bridge trap, but in fact I pressed slide up and lost the game. Because the game is fast pace and the same trap continuously show up, I get distracted by

the same pattern and lose part of my cognitive capacity when I get so used to sliding up to the traps. The game become my instinct and I feel I can do it automatically. The loss of focus makes me make a slip error. To prevent this, the interface can be redesigned to a more simplified version with less distraction outside of the running trial. The removal of extra distractions can save the user more cognitive load on the task and make them focus more on the task rather than the context. Also the interface may show a longer portion of running trial on the screen so the user can have more time to analyze and make plan to the next action they need to perform. But this will also make the game less fun and less challenging.

3.2 Mistake

When I first start to play temple run, I made a lot of mistakes because I am not sure what my goals are and how to achieve them. For example, when I encounter a fire bridge trap, I don't know whether I should jump or slide to escape it. Because I think there is space both underneath and above it, I can probably do both jump or slide. In fact, the fire bridge needs a slide to get through. I made the mistake because there is a gulf of evaluation between my expectation and the state of the game. My past experience is that people usually jump through a fire trap but not sliding under the fire. So instinctively I thought I could pass the trap by jumping.

To avoid the mistake, the interface could simply make the fire traps bigger and block the space above it so the user may only see the space behind it. In this way, users will be more certain that they need to slide down to escape the fire instead of jumping up. Or the interface could simply use an ice bridge as the trap. Sliding on the ice or snow matches more with people's expectations.

3.3 Challenging task

One of the challenge of this game is its fast pace, so the user need to use heavy cognitive load on the task to make sure they don't make any slips or mistakes. As one mistake will end the game. Sometimes the distance between two gaps is very close, I haven't realize what actions I need to take that I already bump into the traps and die in the game. The way to get through the double traps I later learnt is to jump or slide at the perfect timing so that I can get through two traps at same time. Unlike regular traps that I can jump or slide a bit early, the double

trapes need me to jump right before I fall into the trap. A way to improve the design that can help user improve their performance is to make the traps more discoverable to the user. For example, avoid two traps being the same and make them two distinct color or shapes. The users usually are more sensitive to two objects with different color and shapes. This may help them to recognize the double traps in advance and better prepared to take actions.

4 QUESTION 4

Amazon is a interface with good representations of its contents. It uses texts and pictures to illustrate the contents it wants to deliver to its users. It lists out the categories of products into a dropdown menu beside search bar. The list of products lays things out and help the users easily understand where to look for the products and narrow down their search. Also there is no extra information that can distract the users. The product information are well explained by text and pictures. The view grid is simple and easy to read with the product picture, price, customer review and shipping time. The information is nothing too less or too more. Meanwhile, the interface uses icons to map user's perceptual model with the interface outcome. For example, the shopping card was designed with a shopping cart icon with label "cart" as the signifier. The icon enables the users to understand the feature and match their expectation with the outcome when they press the button.

A bad example of representation might be piazza. When I first use piazza, I had a hard time to figure out where to look for the information I needed. First, the interface has too much information displayed. The category bar has more than ten categories displayed so it's hard for the user to find out the right category. The page is full of texts instead of combining with illustrations of pictures or audio information, which takes more cognitive effort for users to navigate through. Another violation of a good representation criteria is the objects and relationship. The category tabs do not have a clear icon for easy identification. Some tabs have the same folder icon and this makes it hard to differentiate between the objects and their relationships. The tabs are so unclear that user may make slips or mistakes if they do not pay enough attention to the tab labels.