

Assignment P2 – Summer 2021

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1 HOUR OF TASKS

During the course of a (particularly busy!) hour at work this past week, I engaged in the following tasks:

Task	Goal	Interface(s)	Object(s)
Leading remote One-on-One conversation	Happy, engaged employee	Microsoft Teams	Computer, Camera, Employee Development Plan
Leading a Team Huddle	Shared understanding of Team Project Status	Microsoft Teams; Miro; Jira	Computer, Camera, Digital Whiteboard, Execution Dashboard
Respond to an Email	Provide info. for colleague to complete his/her task	Microsoft Outlook (Reply Function)	Computer; Microsoft Outlook Overall Application
Respond to Teams Message	Sharing info. for colleague to complete his/her task	Microsoft Teams (Messaging Function)	Computer; Microsoft Teams overall application
Approve / Deny Application Access Request	Allow requesting user access to the target application	ServiceNow	Computer, User's Access Level, User's Team (for approval decisioning)
Review Slide for upcoming presentation	Provide feedback on presentation material	Microsoft PowerPoint, Microsoft Teams	Computer, Presentation Context (for context feedback)

1.1 Leading a Team Huddle

Directness: The object of the interaction is actually relatively direct. The interfaces that we use in that session provide a great amount of detail, but the core of the interaction / task is the human communication of status and challenges to

execute the current work. There is some indirectness that exists within our project planning and digital whiteboard tools, where the objects are manipulated in an interface; however, the conversation itself is very direct and the most critical.

Visibility: The conversation itself is very invisible and natural from a human perspective. However, navigating a number of different interfaces to facilitate the task can make the overall task much more visible. Setting up the remote meeting, changing the visual reporting statuses of project deliverables, and reviewing the visualizations are all things which are still quite visible, and absolutely have a learning curve (for myself, my team, and my stakeholders).

1.2 Responding to an Email

Directness: The interaction of this task is actually relatively close to the object of the task. Usually when I am responding to an email, I am in the interface where I have read the previous email, and there is one (well described) button to press to start a response. The manipulation is relatively direct as well as the content of the email is words that are written via the keyboard.

Visibility: This interaction is relative invisible to me, but it is a learned visibility. I have used email (and specifically Outlook) for many years. As such, I have learned how to quickly generate the steps to execute the reply, and focus on the content of the reply, rather than the interface. When I was first learning the tool, it took me longer; however, compared to some others, this task was relatively easy to execute even with limited training with the platform.

1.3 Approve Access Request

Directness: The interaction of this particular task is quite far from the object of the task. I navigate to a specific screen to make the approval, but I have to bring in context from a number of different interfaces to make an approval decision. Approving or denying the access request is ultimately one click decision, but it is not quite intuitive or direct.

Visibility: The interface itself is also quite visible, rather than invisible. To navigate to the approval screen, I launched the application interface, navigate to the correct screen, scroll to the correct access and then make the approval decision based on outside factors. It has become more invisible than when I first started using the interface, but that was through learning rather than good design.

Previously I thought much more about the interface than now. Also, I suspect that the task will become much less visible in the future as well as the team is rolling out email approval functionality with one click in the coming months.

1.4 1.4 Review Slide for Upcoming Presentation

Directness: Parts of this task are very direct, and others are much less direct. For example, when I am resizing an object or aligning four images on the same row, these are very direct. To resize, I can click and drag in the corner, or if I am on my tablet, I can resize the object with my finger. Also, the interface supports the alignment of shapes by showing a dotted line to guide me where I should drop the image. On the other hand, giving contextual feedback about the content of the slide (e.g., what is the goal of the presentation, who is the audience, what are the audience members' motivations, what is the background politics associated, etc.), the directness of the task is much lower.

Visibility: For me (who has used the PowerPoint tool for many years), the interface is surprisingly invisible. I know where the major shortcuts are to perform the actions I need. Also, as a team leader, I often (not always!) know the context of the presentation material and the audience as I am often the one who established the required task. However, this invisibility is learned over time.

2 INVISIBLE BY LEARNING – COMPUTER KEYBOARD

A personally critical interface that has become invisible (or nearly so) over time and with much learning is efficiently using my computer keyboard.

2.1 Interface Components with Much Thought

Originally, when I was first learning typing, I had only limited experience with the interface and had not memorized the key positions. As such, when I was trying to type a word or a sentence, I constantly looked back and forth between the computer screen and the keyboard to identify the right key to press next. Not only did this take longer to type, but it also caused more errors and rework in typing longer sentences and papers. Additionally, my cognitive load spent on finding the right key decreased my ability to focus more on collecting my thoughts and articulating them on screen. The interface is also much different than writing, so the initial learning curve caused me to prefer written

assignments over electronic assignments as I could more quickly write my thoughts rather than creating them electronically.

2.2 Current Thought Process

Now, when I am using a keyboard, I can convey my thoughts as fast if not faster than writing. There are still times when I have to look for a specific shortcut, hotkey, or formatting mark, but the execution time is so much lower and much less limiting than it was previously. However, getting to a level of mastery with the interface was largely painful (personally), and took considerable time! In high school, we were recommended to take a course in typing to build proficiency in the skill. It took me a few months of regular use and many hours of work to remember the locations of different keys. It took a ton of repetition and learning to build and increase the executional ability and speed of my typing to get to some level of proficiency in the interface.

2.3 Getting to invisibility more quickly

In the case of the keyboard, I'm not sure if redesigning the interface like-in-kind would be the best approach. Changing the layout of the keys to be alphabetical or an alternative layout would still require quite a bit of time to build the muscle memory and skill required to type at a speed that is comparable or faster than writing. To make the interface invisible more quickly, I might consider how we might improve the design of the digitization of writing. For example, allow a user to use a stylus on a screen interface, and create more accurate programs for deciphering that writing and translating it into text. Alternatively, one might design an improved speech to text interface to alleviate the need to interface with so many keys. One argument against this is that formatting and editing is not as quick as a keyboard interface, but one could also build a hybrid system with more limited keys primarily focused on editing and formatting and a speech to text interface for the words themselves.

3 HUMAN PERCEPTION - RUNNING ON ADVANCED TREADMILL

3.1 Existing Design

Running on an advanced treadmill requires a number of different human physical, cognitive, and perceptual systems working in unison to both execute the activity and likely reach the users goals for the exercise. For example, when using

a treadmill, a user could have a goal to run a certain time, to complete a predefined routine, to burn a certain number of calories, or to maintain a certain heart rate threshold for a specified amount of time (or some combination of these).

3.1.1 Visual

From a visual context, different treadmills have different quality of visual interfaces with which the user can interact with. On the most advanced treadmills that are typically found in more costly fitness centers, the treadmill is equipped with a screen which displays not only information about the exercise, but it can also play or stream television shows, allow a user to interact with his or her music player, or even display some scenery from a recorded run from a distant country. In other treadmills, the interface is a bit simpler and focuses mainly on providing the user with visual indications about the exercise and progress (in a general context or towards a predefined goal). For example, the treadmill might cycle through certain simple visual interfaces that show: the number of steps, the number of miles run/walked, the heart rate of the user, or maybe the stage of the user's exercise program.

3.1.2 Auditory

From an auditory context, again different treadmills have varied amounts of digital stimuli and feedback they relay to the user. In advanced treadmills, you may have a recorded voice giving regular feedback on the performance of the run, and that voice may also provide encouragement to the user during different sections of the exercise (or if the user has slowed his or pace below some threshold). On simpler treadmills, a user may be provided with some set of simple tones or beeps when he or she has passed certain thresholds as well (e.g. each time the user passes a "lap" or mile, each time the user burns 100 calories, when the user's heart rate rises above a threshold or moves above a safe threshold).

3.1.3 Haptic

From a haptic context, the treadmill interface design has more of a limited interaction with the user. The design of the handles of some treadmills introduces differentiated, smooth metal section where the user can activate the heart rate monitor. Additionally, there is also quite substantial haptic feedback inherent in the task itself the user experiences each time a foot strikes the ground on the treadmill belt.

3.2 New Design

3.2.1 *Visual*

For a new visual design, it might be helpful from a safety perspective to add a visual indication or warning on the treadmill if a user is trending and approaching the rear end of the treadmill, which could take the predominant place on the screen. Especially for new users, this might help prevent some injury of users falling off the moving belt.

3.2.2 *Auditory*

For a new auditory design, it might be helpful for more advanced runners if the treadmill gave an auditory cue if runners were achieving a specific run / step tempo. Some runners aim to achieve a certain “strides per minute” value, if they received some auditory cue, they could better improve their tempo training.

3.2.3 *Haptic*

For a new haptic design, I have often had trouble using the heart rate monitors that are embedded into the handles of the treadmill. I suspect that this is for a number of reasons relating to improper hand / meter connection. As such, it may be helpful for the treadmill to return some vibration or other haptic feedback when a good connection is established rather than returning an inaccurate reading.

3.3 Equilibrioception - New Sense Modality

In this case, I believe **Equilibrioception** is critical feedback inherent in the use of a treadmill. Equilibrioception is “the sense that allows you to keep your balance and sense body movement in terms of acceleration and directional changes” (Hiskey 2016). As the user is running on the treadmill, the user most constantly (consciously and unconsciously) monitor whether he or she of running correctly or may fall. Also, in general, with impaired equilibrioception, the user may not be able to correctly or safely operate the treadmill device in the first place.

4 REDUCING COGNITIVE LOAD

4.1 Using Multiple Modalities

An interface that frequently causes me great frustration is the **audio and Bluetooth setup** on my 2011 Toyota Corolla. As I mentioned in the P1 assignment, this interface causes a huge gulf of execution when trying to pair a Bluetooth audio player, change any audio set up functions, or perform any “hands free” functionality. This specific interface is partly controlled with buttons on the audio console, the steering wheel, and by voice commands. However, the execution a specific task, does NOT allow for multiple modalities of execution.

To presumably ensure that a user does not operate the menus while the car is in motion, the audio setup requires the use of the “hands free” push buttons, voice commands, and the audio console to execute commands. When I want to execute a command, I am forced to listen to a long menu of options, push a talk switch, and clearly use my voice to select an option. If I was not clear enough, the car forces me again to listen to the options menu and try to reselect an option. This causes much frustration when I am stationary, and I can safely read the screen in *Figure 1*.

Redesign: I would very much appreciate an alternative text modality where I can use the regions marked in RED in *Figure 1* to navigate through a simple text-based menu (while stationary / in Park). Specifically, as a first approach, I might design a menu of the 4 or 5 actions could be scrolled through with the “Seek Track” or “Type Folder” button. I would add “Confirm” and “Back” buttons that would be in the button tray below the screen to navigate to the next or previous screens. This would allow for me to more quickly change and navigate through settings while stationary, rather than waiting through the lengthy voice command process.



Figure 1— This is the display that is in my vehicle. The buttons highlighted in red could be used to simply stationary interaction with the audio menu. [The Car Connection](#)

4.2 Emphasizing essential content while minimizing the clutter

Another interface that I use quite a lot at work is the **ServiceNow platform**. I will be the first to admit that I am neither an expert at the platform nor have I fully explored all the features and functionality of the program, but as a novice user I have faced some challenges with the interface.

One major benefit of the software and interface is that it is so feature rich. There is so much functionality that is enabled by the platform from many perspectives like Governance, Risk, and Controls, IT Ops, access management, and asset management to name a few. However, when I navigate to the platform, I often lose some of the major signal and the essential content I need for a particular use case with the noise of all of the functionality, dozens of menus, and even more sub-menus (as seen in *Figure 2*).

Redesign: Because I am a novice, I'm not sure if these features are available in the current platform; however, a couple redesign features that would personally help me would be:

1. a simple high-level dashboard for critical, time sensitive tasks for non-administrator users
2. A customizable interface so that I could filter out many of the non-required or lower priority tasks.

I believe adding these pieces of functionality would greatly improve my ability to focus on my critical tasks. Then, if I needed additional functionality, I could personally customize the interface to see the more detailed menus.

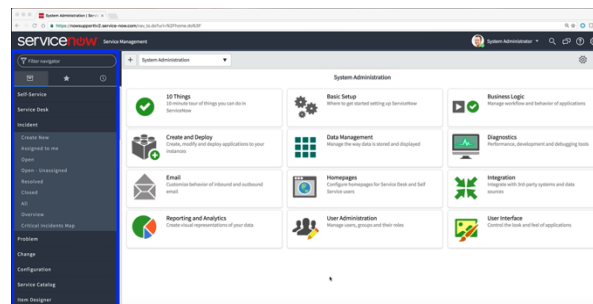


Figure 2— This is similar to the user interface that I interact with at work. Source: [ServiceNow Support Youtube Channel](#)

5 REFERENCES

Hiskey, D. (2016, May 31). *Humans Have a Lot More Than Five Senses*. Today I Found Out. <http://www.todayifoundout.com/index.php/2010/07/humans-have-a-lot-more-than-five-senses/>.