# Human Computer Interaction CS6750: Final Project

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1 INTRODUCTION

There has been a huge shift in fitness routines moving from the gym to the home over the past few years. This is due in part because of the corona virus pandemic, lockdowns, and social distancing, but also because of increasingly sophisticated wearables, health tracking, and social media. As a result, at-home gyms and fitness apps have boomed in popularity. From March 2020 to October 2020, health and fitness equipment revenue more than doubled to $2.3 billion according to NPD retail data (Shaban 2021). Moreover, the sale of treadmills soared 135 percent while those of stationary bikes nearly tripled (Shaban 2021). One such company who has benefited from the shift of gyms to at-home fitness is Peloton. With over 5.9 million members on the platform (Dean, 2021), the Peloton app offers its users access to workout classes via an app in addition to being integrated with Peloton branded equipment. Users who pay for the Peloton subscription can attend live classes scheduled daily or join recorded classes on-demand.

Figure 1—Peloton app Strength classes and filter options. Source: IOS Peloton App.
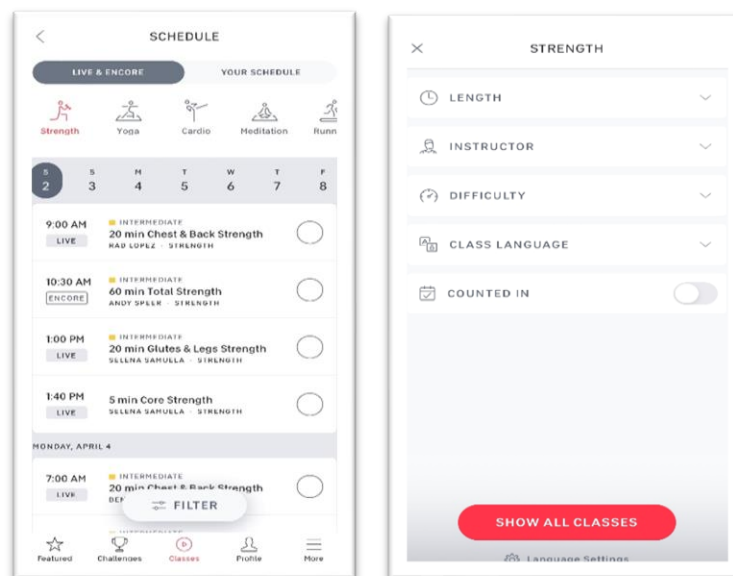
Now, despite the flexibility offered by Peloton to schedule and attend workouts, it does not allow the user to create tailored body part split workouts, or dividing training sessions to focus on different movements, lifts, or body regions, to their schedules. Figure 1 above shows one of the class types, Strength, and the filter functionality available to users. Additional class types include yoga, cardio, meditation, running, cycling, walking, and two different bootcamp style classes. Each of these classes include the ability to filter based on the user's preference of class duration, instructor, difficulty, and language, however, the task of creating workout splits is not a feature offered within the Peloton app. This task will be the focus of study for this assignment.

2 INITIAL NEEDFINDING

2.1 Domain and Problem Space

The health and fitness app domain are a worldwide industry supporting digital products across all major mobile platforms. The domain has an abundance and diverse range of health and fitness apps. In fact, app developers launched more than 71,000 new health and fitness products in 2020 (Sydow, L. 2021), and is categorized by challenges in data integrity and privacy protection, development time, integration of wearables, and regular updates. The breadth of health and fitness, combined with the need for data protection, makes digital fitness an attractive research area for human computer interaction (HCI).

Because of the enormous number of exploratory opportunities, the class of workout and exercise app interfaces was selected due to their user-friendliness to the public and universal appeal. As opposed to nutrition and/or activity tracking health and fitness apps, which appeal to a smaller subset of at-home workout routines, workout and exercise apps form an essential interface between users and fitness goals. Furthermore, as it relates to fitness goals, the benefits of workout splits are plentiful and integrating them within a workout app is advantageous to the user. A general rule of thumb is at least 48 hours should be allowed between high intensity exercise of the same muscle groups to allow your muscles the opportunity to rebuild and reduce any risks due to overtraining. As such, enabling the user to utilize workout splits, or suggesting the benefits of

training using workout splits, is not only informative, but also reduces the risk of injury to the user and maximizes recovery time and muscle growth.

2.2 User Types

The intent of this assignment is to improve the workout functionality of the Peloton app for all iPhone and iPad users. Users who are applicable to this problem space are new and experienced users who use any of the workout features available in the Peloton app. This would include a user who works out from home a once to a few times a month to users who use the Peloton app for multiple classes daily. Also, because most fitness apps are subscription based and require payment, users will be limited to those over the age of 18.

2.3 Needfinding Plan

The problem space described above leaves a gap in the potential effectiveness of the Peloton app and to its users. To look into improving this, two needfinding exercises will be employed. First, a survey will be deployed to users of the Peloton app. The intent of this needfinding will be to form a data inventory and summarize the results. Second, I will research approximately 50 product reviews. The product reviews will come from research on the internet as well as reviews of the Peloton app via the IOS app store. Given that the IOS app store shows there are 643,000 people who have rated this app, reading existing product reviews should be a very effective indication of what users believe are the strengths and weaknesses of the app.

2.3.1 *Needfinding Execution 1 – Surveys*

Because of the asynchronous way which surveys can be completed, this was the first task employed in my needfinding plan. This survey, which can be found in the Appendix section XXX, was presented to adults who have used the Peloton app in any capacity. A total of 8 questions focus on what types of fitness classes are primarily used, how often a user participates in classes, and, if not currently using a workout split, would a user be interested in using one. To find users, I had to reach out to a network of people who use a Peloton from my personal and professional network. I was able to locate 20 people to take the survey. Also, because of potential biases in the survey, I asked two colleagues to review the questions prior to distribution with the intent being to remove any potential for observer bias and eliminate any leading questions. As a result, the questions

distributed in the survey allow the users to answer the questions in a way that would be most effective when reviewing the results. Moreover, voluntary response bias was an important bias to avoid and was done so by keeping the questions quantitative as opposed to qualitative.

2.3.2 *Needfinding Execution 2 – Product Reviews*

In additional to the surveys, a review of existing Peloton app product reviews will be completed. To start this needfinding exercise, I will review the app reviews in the Apple app store and search the web for other useful information. To review app store reviews, I will be scraping the app store using a Python program. The Python program will use an app_store_scraper module, along with Pandas and NumPy, to gather and review the results. To find the most effective app reviews outside of the app store, I will use a google search with keywords like "Peloton app reviews", "Peloton app workout splits", and "Peloton app home workout reviews". I also think will be useful to avoid the granularity specific to the IOS app as the problem space would be applicable to all users of the Peloton app, regardless of the operating system used to connect.

To review the results of this needfinding exercise, the most effective method is to compile the results in a table built on review sentiment (good, neutral, and bad). Using this, I can connect any common themes and thus gain a better understanding of whether the problem space I have outlined is present in reviews and, if so, build a better interface to address the issue.

2.4 Needfinding Results

After reviewing the results from the two needfinding exercises, it is evident that an improvement to the Peloton app to support the creation of the scheduled workout splits is warranted. The fact that so many people have moved their fitness routines from gyms to the home, along with a need to organize workout routines, supports the need to have personalized workout routines in the tools users are using for fitness.

2.4.1 *Needfinding Results 1 – Surveys*

As stated, 20 participants responded to the survey. After reviewing the results, 8 of the participants who use the Peloton app also do some kind of weightlifting while another 6 do some other type of fitness routines as well. Also, of the 8

people who use the Peloton app and lift weights, all but 1 follow a schedule. This is a key indicator that including the ability to schedule workout splits in the Peloton app is a worthwhile improvement. Furthermore, the results from question 8 show a majority of people, 12, would use the feature if it was available. As a result of this needfinding exercise, I can confidently say the takeaway is that there is a need to continue the needfinding process and redesign the Peloton app is a way that supports scheduling workout splits.

2.4.2 *Needfinding Results 2 – Product Reviews*

The reviews from the Apple app store proved to be very useful. What immediately stands out is that, out of over 630,000 reviews, the app has a very favorable rating of 4.9 out of 5 possible stars. There is an overwhelming number of positive reviews, and the product is well liked overall. Most of the negative reviews I read through share a common denominator of issues with the app. There were issues with the app crashing, issues with sound, and syncing issues with wearable monitors like the Apple Watch. As it relates to positive reviews, majority of them had to do with the Peloton bike and treadmill. Outside of there, there we also many positive reviews on the various classes, including strength training. As fitness routines are moving from gyms to homes, having strength training available in an app is extremely useful and there are a lot of app users who take advantage of this. Moreover, the reviews regarding strength training are clearly a mix of experienced and novice users.

The result from my web search also proved useful. Because of the popularity of Peloton, there is a plethora of reviews on the internet. Again, most of the reviews were very positive and it was difficult to find negative reviews outside of the concern over the price, music choices, and other irrelevant items not really having to do with the problem space. However, because of the shift in fitness location, the positive reviews for at-home workouts were everywhere.

2.5 Data Inventory

Table 1 — Data Inventory Items for Peloton App Users.

Inventory Item	Observation
Who are the users?	The results from survey show that the majority of users are between 26-35 years of age (9), and the next largest age bracket of users is between 18-25 (7). The rest of the users fall between 36-55 years of age (4). Interestingly, no one in the survey was older than 55. Additionally, all the users participate in a fitness activity at least once per month.
Where are the users?	Users of the Peloton app are in their homes. Regardless of the device being used to connect to the Peloton app (phone, smart TV, Peloton Bike/Treadmill), all users are using the app from home.
What is the context of the task?	The context of the task is that users are participating in some kind of fitness activity using the Peloton app. While most are moderate users of the app using it 10-19 uses per month (9), there is a large group that use it more than 20 times per month (7) .
What are their goals?	The core goal of each user is to improve their health by participating in a fitness routine. As such, using the Peloton app is one vehicle in which this is accomplished. Users who use the Peloton app also participate in fitness outside of the app. 15 of the 20 survey participants participated in exercise outside of the Peloton app.
What do they need?	Users of the Peloton app require an internet connection and a device which can run the Peloton app. Users also need to maintain a Peloton membership, so they will need a means with which they can pay for access.

Inventory Item	Observation
What are their tasks?	Users who physically work with the Peloton app are tasked with opening and interacting with the apps interface to find an exercise class to complete.
What are their subtasks?	The users' subtasks include logging into the Peloton interface, searching for classes using filterable criteria, and connecting to classes to exercise. Also, because of the large number of instructors and class types, users' subtasks will include reading reviews to find instructors which are preferred over other instructors. Lastly, the users' subtasks include remembering previously completed classes and upcoming classes that have been scheduled.

2.6 Defining Requirements

Table 2 — Defining Requirements for Peloton App Users

Requirement	Description
Functionality	Enable the user to schedule, attend, and complete classes bases on a configurable workout split schedule.
Useability	The user should be made aware of the advantages of using a workout split schedule and included in the scheduling of strength style exercise classes.
Learnability	Setting up a schedule utilizing workout splits would be a setting within the Peloton app.

For this assignment, the design improvement to the Peloton app will focus on further developing functionality, useability, and learnability to support a workout split style schedule. Per the results of the survey, users who participate in strength style fitness already incorporate some type of workout split into their schedule and, as a result, would use this functionality if available in the Peloton app interface. Because this is not currently a supported feature, useability and

learnability are negatively affected because of the complexity involved with scheduling classes to support a workout split schedule. Moreover, the gulf of execution is much larger than it should be because users do not currently have access to an integrated feature to support their preferred workout schedules using the Peloton apps strength interface.

3 HEURISTIC EVALUATION

This heuristic evaluation is grounded in the 15 universal principles for HCI design influenced by Don Norman, Jacob Nielsen, Constanine & Lockwood, and the seven principles of universal design, as well as the principle of distributed cognition.

3.1 What works well and why

As stated earlier, there is an overwhelming positive sentiment as it relates to the Peloton app. There are several reasons for this positive sentiment and are described below:

3.1.1 *Discoverability*

When the user first opens the Peloton app, the interface is well laid out and has a high level of discoverability. That is, the user does not need a high memory load to make objects, actions, and options visible. Because the principle of discoverability is present, the user can easily identify what actions they need to take to complete a task.

3.1.2 *Simplicity*

Regardless of the user's level of experience, knowledge, or current cognitive load, the Peloton interface is easy to understand. This makes interacting with the interface natural and simple. Moreover, at no time is the user presented with any information that is irrelevant or not needed. As a result, the simplicity found within the Peloton apps interface works well for the user.

3.1.3 *Consistency*

The Peloton apps interface has a lot to offer the user. Because of this, there is a lot of information contained within the interface. However, across the entire interface and corresponding options, the principle of consistency is employed. Because of this, what is learned by using one feature of the app can be easily applied to the other features. As a result, the users need to rethink or remember what certain words or actions do is not needed. This greatly decreases the gulf of execution and enables the user to complete a task with ease.

3.1.4 *Flexibility*

The principle of flexibility within the Peloton interface accommodates a wide range of user preferences and abilities. As a result, any user of the Peloton interface is supported be several different interactions to complete the same task. For example, there are several ways in which a user can search for a strength style class. The result is a natural way for people to engage with the interface as opposed to forcing the user to use one method against their expertise or preferences to complete a task.

3.1.5 **Distributed Cognition**

Because the Peloton app enables the creation of a user profile, cognitive tasks like reason and remembering can be offloaded to the apps interface. This distributed cognition enables users to reduce the cognitive load and memory needed to search for, participate in and/or schedule classes. As an example, when a user schedules a class, the class is added to a calendar that will remind the user of upcoming classes. As such, maintenance of the user's schedule is offloaded onto the Peloton app reducing the user's mental burden.

3.2 **What doesn't work well and why**

3.2.1 *Gulf of execution*

While the gulf of evaluation (distance between the effect of the action and the user's understanding of the result) might be small, the gulf of execution (distance between the user's goals and the action required to realize the goal) is larger than it should be. As the results of the survey have shown, the ability to focus strength training on a single body part or region of the body is not easily executed. If a user were to complete the task of scheduling a 4 day workout split, they would

have to search a long list of strength training classes available and add them re-membering specifically what body part/region was to be exercised in what order. As a result, the cost in time and gulf of execution to complete this task is much larger than other more basic tasks.

3.2.2 *Discoverability*

The wider gulf of execution, as it relates to the problem space, is a direct result of lacking discoverability. While the interface in general uses the principle of discoverability well, it falls short when it comes to filtering for specific body parts. As an example, when a filter is applied to strength classes for "upper body" style classes, there are over 800 resulting classes. A user who is looking specifically for arm workouts would need to search through all resulting classes to find one that fits their need. Because all the needed options are not present and visible, the users cognitive load is higher than it should be, and the user is exposed to distracting options with extraneous information.

3.2.3 *Flexibility*

As explained in the survey response, the design of the Peloton interface does not accommodate all ranges of individual preference. Because the use of a body part/body region workout split is not currently supported, the act of accomplish-ing certain tasks is difficult and users are forced into using the app in a way that contradicts with their level of expertise and/or preferences. As a result, the Pel-oton interface done not do a good job of affording the user flexibility as it relates to the problem space.

3.2.4 *Equity*

Like the principle of flexibility, the principle of equity is not used well in the design of the Peloton app interface. Simply stated, all users of the Peloton app do not have the same experience. Users who make use of a workout split style schedule must work much harder that users who participate in classes at will and without regard of body parts being exercised. The result of this is a design that is not useful or marketable to people with different abilities and thus falls short on the universal design principle of equity.

3.3 Heuristic Evaluation Summary

It is clear that, for majority of users, distributed cognition, the principles of simplicity, discoverability, flexibility, and consistency work well together and create a positive user experience. As a result, the gulf of execution and gulf of evaluation is quite small for all users, and new users of the app can quickly figure out what they need to do when their goal is to accomplish a task. That being said, there are gaps in the principles of discoverability, flexibility, and equity that reduce distributed cognition and consequently increase the cognitive load and mental burden for some users. Together, these violations increase the gulf of execution for users and will be addressed moving forward with this assignment.

4 INTERFACE REDESIGN – 3 PAGE

- Redesign of the interface will be completed using a wireframe prototype
- Prototype will include several redesigned screens to include the addition of a workout split style fitness schedule alongside the ability to filter more specifically on body parts (Arms, chest, back, legs, etc.)

5 INTERFACE JUSTIFICATION – 3 PAGES

- How are the defining requirements utilized to make a better interface?
- What design principles make this a good design?
- Summarize the wireframe prototype

6 EVALUATION PLAN – 2 PAGES

- Qualitative evaluation plan will be used
- This will be a survey – hopefully around 25 participants to take and evaluate the redesigned interface.
- Mitigate biases?

7 EVALUATION EXECUTION AND ANALYSIS – 2 PAGES

- What does the data say?
- Is this worth it – any changes?

8 REFERENCES

(1) Shaban, H. 2021. The pandemic's home-workout revolution may be here to stay. The Washington Post.

(2) Sydow, L. 2021. Pumped up: Health and Fitness App Downloads Rose 30% in a landmark year for Mobile Wellness: Data.ai blog. data.ai.

(3) Dean, Brian. "Peloton Subscriber and Revenue Statistics (2021)." Backlinko, 15 Mar. 2021, backlinko.com/peloton-users.

9 APPENDIX

9.1 Survey Questions

Question 1: Select your age range.

a) 18-25
b) 26-35
c) 36-45
d) 46-55
e) 56 or older

Question 2: How often do you workout/train?

a) 1-5 times per month
b) 6-10 times per month
c) 11-more times per month
d) I don't participate in any fitness activity

Question 3: How often do you use the Peloton app in any capacity?

a) 1-9 times per month
b) 10-19 times per month
c) 20-more times per month
d) I don't use the Peloton app in any capacity.

Question 4: Do you exercise using anything besides the Peloton app?

a) Yes
b) No

Question 5: If you answered Yes to question 4, outside of the Peloton app, what do you primarily do?

a) Weightlifting
b) Cardiovascular activity (Running/biking outside, swimming, etc.)
c) Sports
d) Other

Question 6: If weightlifting, do you follow any type of fitness routine schedule?

a) Yes
b) No

Question 7: If you answered Yes to question 6, do you use a workout split? Example: Day 1 legs, Day 2 back and biceps, Day 3 chest and triceps.

a) Yes
b) No

Question 8: If accessible in the Peloton App, would you utilize a workout split?

a) Yes
b) No