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Wednesday Lab

Sprinkles ATM Project - Redesign

Introduction

In this project, our group will be visiting the Sprinkles ATM and evaluating the interactions involved in buying a cupcake and then recommend design changes. The Sprinkles ATM on campus was put into place last year in front of the USC bookstore in the center of campus. It offers "freshly-baked" cupcakes at a upscale price of 3.50 per cupcake. Ever since its conception, it has garnered wide popularity with USC students and visitors.

Our study will focus on the ATM's visual display and user interface. We conducted physical measurements on Monday at 3pm, a normal time for students to be purchasing these cupcakes. The tools utilized are a stopwatch for the time motion study, a tape measure to measure anthropometric data, and a camera to document the interface. After evaluating the ATM, we realized some issues with the current design and developed design changes to better improve the machine.

Summary of 1st Report

a. User Needs and Profile

i. Our main user is the USC student. USC Students are diverse - composed from a wide range of racial and socioeconomic backgrounds.

ii. In terms of experience and training, USC students are tech savvy. After all, this is the generation that grew up on touchscreen devices and minimalists design. In addition, this group of students are familiar with similar machines such as automated grocery checkout machines (such as the ones in the village) and self-order machines in restaurants. Aesthetics matter just as much as functionality when selling to USC students.

iii. The USC students' critical to quality (CTQ) characteristics are the following: How fast it takes to obtain the cupcake, how easy it is to use the machine, how accurate the machine is, and how aesthetically pleasing the machine is. On the other side, the ATM also has expectations of what the user should be able to do. The user is expected to be able to go up to this cupcake machine, read and interpret the information on the screen, push buttons that correspond to their order, check out via credit card swipe, and

finally grab their desired cupcakes. Below is a snapshot of that displays everything we needed to know about our user.

b. System Parameters

i. Our system parameters are self explanatory for the most part. The ATM is located on the front of the USC bookstore facing outwards. It is fully operational 24/7 as long as it has stock available for purchase. It gets used mostly during the day and is located under an awning so it is protected from most, if not all, weather conditions. The ATM is self lit to some extent and the lighting around the general area is more than enough to suffice for nighttime conditions. As it exists right now, anthropometrically, it is ideal for the average customer but it isn't the most accessible to people with physical disabilities.

c. Interactive Task Description

i. The task we are evaluating at the moment is the ordering of the cupcake itself. First, a user approaches the ATM and then touches the interactive screen. From there, they can see which cupcakes are available. Once they make a choice, they can select that option and check out. They have 30 seconds to swipe their debit / credit card through the reader. Then once it's approved, the ATM pulls the cupcakes and leaves them in an alcove for the customer to then pick up.

d. Interface Design

i. Interface design is concerned with describing the user behavior and defining how the system will accommodate and respond to that behavior. The Sprinkles ATM has a very simple and easy to use design touchscreen. It it is very straightforward and anybody who has never used it before can

understand it quickly. Placed on the right side of the bookstore, the ATM is a pink machine on an entire pink background that instantly catches your eyes and is very hard to miss. On the machine, it spells out “CUPCAKE ATM” in all white capital letters which provides a steep contrast against the pink background. Underneath, it says “Sprinkles” in brown cursive letters that provides the brand recognition. The machine itself is rectangular with three sections: the touchscreen, credit card swiper, cupcake dispenser.

ii. With a very simple welcome page that states the name of the company and what it is, including instructions (“touch to begin”). The screen also flashes in different colors to capture one’s attention. Once the screen is tapped, then you are taken to a screen that lists the different available flavors by providing a picture and label underneath each one. The visual display of the flavor allows the customers a better experience as it provides a better depiction than just a list of the names especially if a flavor is unknown. Additionally, one is taken to a pop up screen to select the specific quantity needed and to proceed with the next step. There are three buttons, each with a different color, to differentiate the three options available. When one is ready to checkout, a different screen is provided with instructions on the final step to pay with credit card with a timer of 25 seconds. Waiting for the cupcake is a very interactive experience, as there is a video of the internal atm machine showing the robotic arm reaching for the respective flavors and placing them at the dispenser.

e.

Figure 1: Welcome Screen

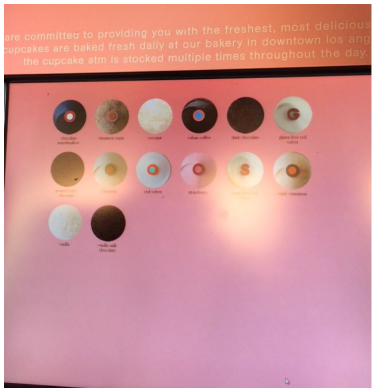


Figure 2: Flavors Screen

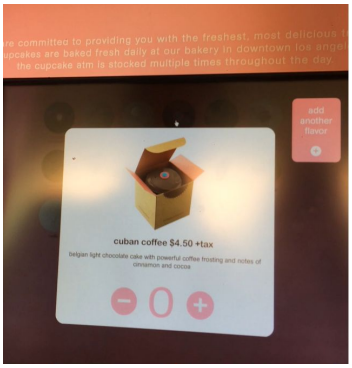


Figure 3: Pop Up

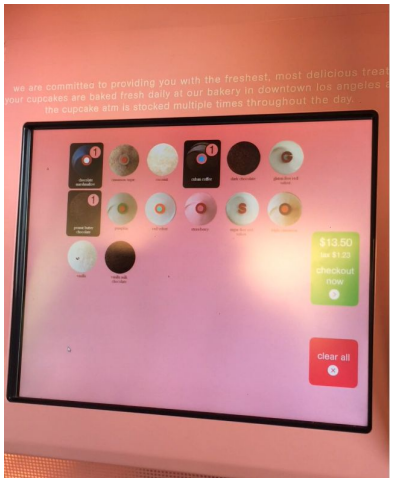


Figure 4: Flavors Quantity

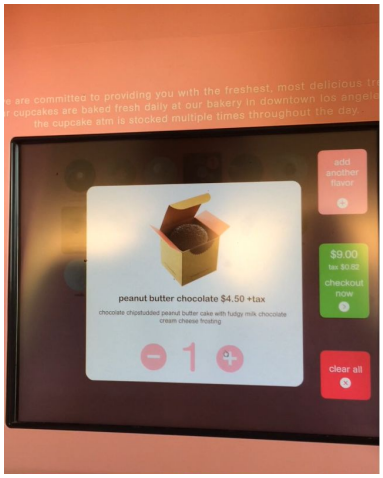


Figure 5: Flavors Selection

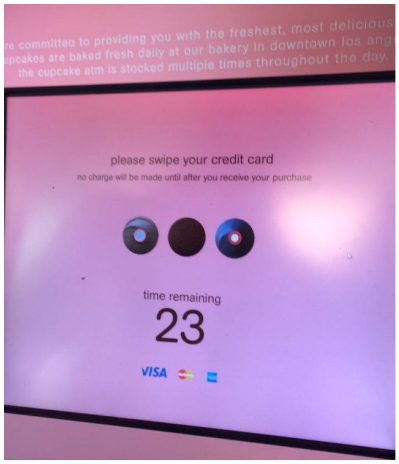


Figure 6: Transaction

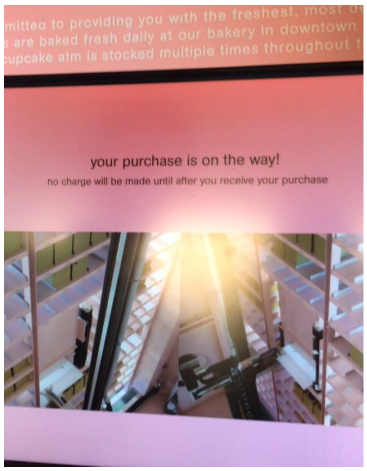


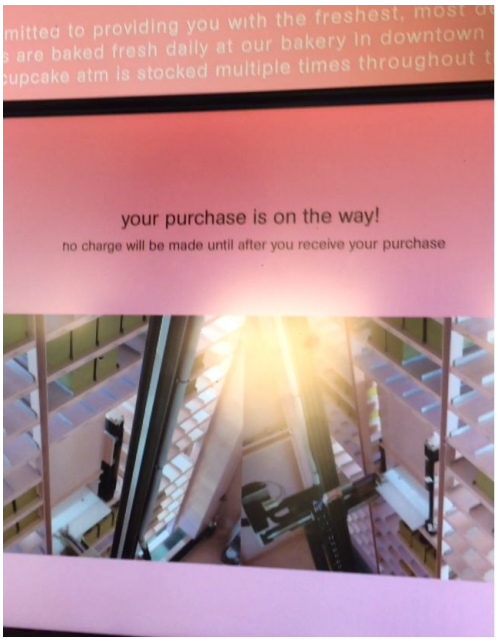
Figure 7: Purchase Handling

Figure 8: Order Retrieval

ATM Redesign

Capacity:

1. What we mean by capacity is that the machine isn't transparent about what cupcakes are actually sold out or available. You know only find out until after you click on a cupcake. This misleads customers and can be very disappointing. A quick design fix would be to simply fade the cupcakes that are already sold out. In addition, the sprinkles ATM often gets sold out. Their carrying capacity of cupcake could also improve. Take for example the figure below that shows newer model of the Sprinkles ATM that hold more. Unlike ours which is has a huge claw in the middle of the whole thing, the other ATM machine doesn't seem to have that.



Speed:

2. In our evaluation, we got that the normal time is 6.3 seconds but that the actual direct observation time of the whole cycle takes 59.6 seconds, this means there is a 53 second gap between the time of action vs the time for decision-making and machine response. Thus in order to decrease the cycle time for an individual to buy a cupcake, we must tackle both issues.
    a. Addressing the decision making means making it easier for the customer to process the screen information at a glance. When you first interact with the USC atm machine, you're directed to this page **(figure one).** The problem with this is that it is too difficult to read or understand which cupcakes are which. That is, the cupcakes and the descriptions are too small.
    b. After doing some online research on the other Sprinkles ATM, I saw some screens that were much better. In **(figure two)**, the cupcakes essentially filled up the screen. In figure two, there are 17 cupcakes, and they fill up in the entire screen. On the other hand in figure one, there are 14 cupcakes that fit less than half the page. While i'm not entirely sure why the USC screen is zoomed out, I think it's because the software has the zoom preset to accommodate more types of cupcakes. In other words, it doesn't automatically magnify even if there are less cupcakes present. As a result, students are forced to click on almost all of the cupcakes just to see what kind of cupcake they were in the first place. This takes up a lot of time and contributes to the waste in decision-making time. A redesign would be to magnify the screen depending on the cupcakes present (fill up the screen

entirely) or to have an option where you can see it scroll through style **(figure three)**

Figure One

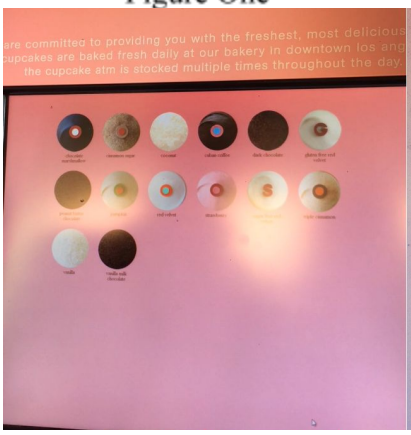
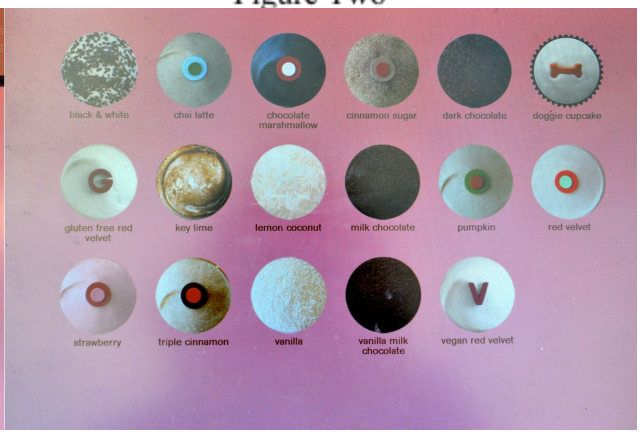


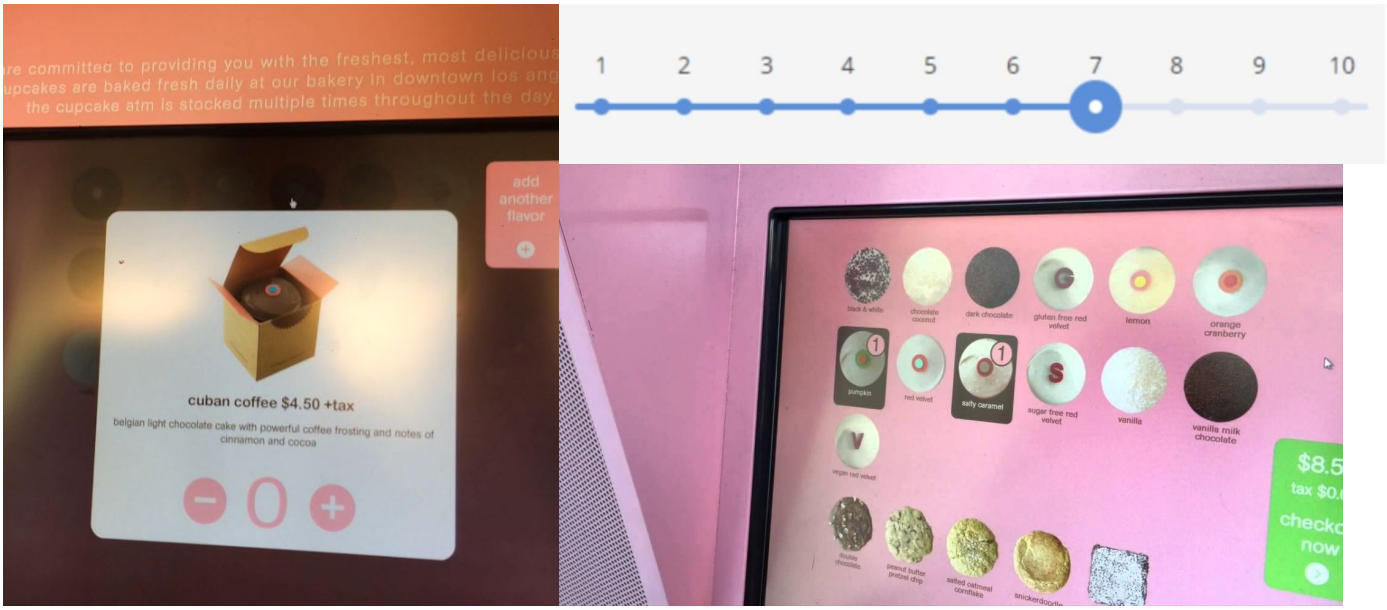
Figure Two



c. For students who are feeling indecisive or have never ordered from the sprinkles ATM, the scroll through design **(Figure three)** would be much better for them. They would be able to see all of the cupcakes in a minimal amount of scroll-clicks and get to see the magnified version of it already as well. The button to switch over from grid style to scroll-through style and vice versa should be located at the top right corner of the screen since 9 out of 10 population is right handed. Since there is a mix between users who are first time buyers and regular buyers, it would be ideal to have the option to switch to both in order to accommodate both user types. Switching to the appropriate version would drastically cut decision-making time.

d. Another way to increase the speed of the process would be to change the way increasing and decreasing order units works. Traditionally, clicking on a cupcake would lead you to **(figure four),** where you would click plus or minus depending on how many cupcakes you want. The problem with this is that a person ordering 10 cupcakes would have to click the plus button ten times. Instead, we could replace this with a sliding scale which would require just a quick click and glide to the appropriate number. It could look something like (**figure 5).** Or on grid mode, the machine could

also just be clicked on over and over again corresponding to how many times you want to order it as shown in **(figure 6).** Again, this would cut down decision making time since you reduce there's the brain has to process new information that results with every new click



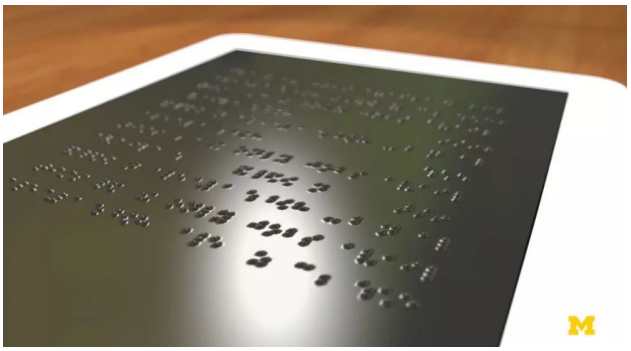
3. Furthermore, the machine response does an equal damage of time waste to the cycle time. Take for example how long it takes for it to read your credit card. Faster processing of the credit card would have to be a software design implementation. Retrieving the cupcake takes the longest time however. Instead of gathering all of the cupcakes ordered (if multiple have been ordered), the claw(which is more of a vacuum)takes it one by one. That is to say, if 3 red velvets have been ordered, it will extract one red velvet and drop it off at the retrieval box rather than being just a two step process. In our redesign, the claw would either be able to handle more than one cupcake (preferably three at a time) or the claw type would have to be completely changed. Perhaps, we could borrow the mechanics of a vending machine where a bar goes up to the row of the cupcake, and the cupcake is pushed from the back landing in the bar. The bar then goes down to the retrieval box and pushes the cupcakes out. While this seems much more efficient, the drawback to this it isn't as cool or cutting edge as the claw type which customers can watch while waiting.

Audio Cues

4. While the current design is very simple and easy to use, there could be some improvements to the cupcake ATM machine. Since the machine is a touchscreen which is visual focused, the loss of eyesight was not considered. If a customer is visually impaired and wants to order, it would be hard for them. Therefore, auditory cues would be beneficial in this case as it provides another method of information distribution. By announcing each step and providing voice instructions, it would facilitate the process a lot better if one's vision is not that good. There should be a complete synchronization of screen text and audio output as each ATM screen is voiced out.

Physical Cues

5. Due to the increase in screen-based media, it can be inaccessible for people with no vision. While the auditory cues could assist them along the process, it may not be enough for



them to complete the task 100%. Braille is a possible solution, but the implementation of it would be tricky because it is a touchscreen. Braille is raised dots on paper and on machines, a pin is used in place of dot which is depressed or raised to match the word. With an increase in technological systems and innovation, a special touch screen tablet with readably tactile surface was made by a team at the University of Michigan. Instead of only showing a single line at a time, this pneumatic system will show a full page of braille by using microfluidics on a planned tablet-like screen. Thus, this braille tablet could be utilized which provides a physical cue as it translates what the screen and audio is saying. With this tablet connected to the machine, a number pad could also be attached to the attached which allows the customer to respond and make decisions. The number pad will have braille on it which would assist in navigating through the screens.

Language

6. Language is another factor that was not considered. The Sprinkles ATM machine only uses English. Understanding the demographics of Los Angeles and population of the USC students, a selection of languages would be beneficial. USC has the greatest international student population in the nation. In addition, Los Angeles is ranked as one of America's most diverse city with nearly half of its population being Latino. Therefore, one can see the need to have a multitude of languages, especially Spanish. At the home screen, there should be the option of either "English" or "Spanish" as they are the most predominant languages. After selecting the language, it would automatically take the customer to the next screen of flavors. The selection of language would indeed affect the other functions like auditory and physical cues.

Cash Utilization

7. Cash utilization is currently nonexistent within the current ATM. The only way to pay is by using a debit / credit card. We believe that adding in a slot (like the one picture below) would be of great use in the system. While cash is no longer the most popular form of payment, it is still used by customers. Without this, the ATM loses some versatility. With this suggested change, we simply believe this would help add value to the overall ATM experience. It adds more payment options allowing for easier user interaction. The slot would easily fit right next to or on top of the card reader. With its placement, there would be minimal confusion over its use.

Panel Design

8. The current design of the ATM is very traditional. As you can tell from the photos above, it matched general expectations but it isn't necessarily ideal. For someone who is physically disabled, the machine is more difficult to use. As a result, for our redesign, we are proposing a non-tilted panel setup for the ATM as seen below. It would be a flat touchscreen surface and it would function almost exactly the same as the current display. The panel would be 3.5 feet above the ground and the panel itself would be 2.5 feet tall and 1.5 feet wide. This way, we could ensure that even people in the 5th percentile would be able to fully use the machine. Luckily for our redesign, the screen doesn't have to be that tall or wide since there aren't many options for cupcake selection. The change would not require a complete overhaul of the current design. Obviously, the panel would have be installed but everything else would need, at most, minimal changes. With this update, we would be able to better optimize the experience for any of our

physically disabled customers. At the bare minimum, having the screen facing directly outward, rather than tilted inwards, will help immensely.