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Final Report

Spinsters

Introduction

For our group- the Spinsters- the design process started with humans. We did not know who we were designing for, or even what we were designing. As avid cyclists, we were excited by the topic of bikes on campus and set out to interview as many bikers as we could. During these discussions, we were able to extract common issues that bikers ran into on campus (such as parking) and were able to delve into more specific questions. In this report, we go through our complete bottom-up design process in detail.

Stakeholders

In the early days of our project, we set out to speak with many cyclists on campus. As our project revolved around bike parking on campus, bikers were the most accessible and obvious group of stakeholders to interview. During these interviews, we realized that we were actually speaking with two separate primary stakeholders- both were bikers on campus. The first group was bike owners who had their own individual bikes and tended to be experienced riders. The second group was Spin users who utilized bike-share company Spins' bikes to commute to classes in a cheap and efficient manner. We were able to distinguish these two cyclist groups since many of their insights were often contradictory. Then based off of our field research, we found that pedestrians were an important group of secondary stakeholders. Pedestrians valued open walkways and efficient class entrances/exits and were often forced to navigate through Spin bikes parked in the middle of walkways. Our interviews with our stakeholders can be found in Portfolio: Interviews.

Bike Owners

Over the course of our project, we met with and interviewed 11 bike owners on campus. Our early discussions included questions to understand a day in their life

as a biker, which would later contribute to our Day in the Life design model. Within this group of bike owners, there were two subgroups: on-campus and off-campus riders; the only difference in these two groups was how they parked in the evenings. On-campus users parked near their apartments or dormitories while off-campus riders would either ride home or park their bike near a convenient bus stop. During the rest of the day, these riders would utilize their bikes as their mode of transport to every class or activity during the day. In the words of one rider, “I no longer care or want to walk”. When we questioned bike owners on the services they value, the top two for every biker was designated bike lanes and bike parking. Every biker was quick to mention that UCSD has a shortage of both from before SPin Bikes were even around; but with the Spin Bikes present, it created an even greater issue. Based on our initial interviews we began to ask more in depth questions pertaining to on-campus bike pathways and bike parking. From this set of interviews, we began to understand that there are specific spots on campus where bike parking tends to be a common issue. These bike parking hotspots included Library Walk, particularly in front of Geisel Library, and near large lecture halls such as Warren Lecture Hall and Pepper Canyon Hall. It was at these hotspots bike owners ran into trouble and also interacted with our second group of cyclist stakeholders, Spin users. Bike owners, when pressed about parking issues at UCSD, frequently mentioned how they were annoyed with how Spin users would park their bikes. The first issue revolved around Spin bikes being parked in the bike racks. Theoretically, it would make sense for a user to park his or her bike in the bike rack- but because Spin bikes are dockless, bike owners complained that they were unnecessarily taking up an impacted resource. The second issue regarded Spin riders parking their bikes randomly throughout campus in bike lanes and in locations which made accessing bike racks difficult. Overall, as bike owners heavily value bike racks, they were understandably perturbed by Spin bikes using up the bike rack. To see our day in the life model for bike owners refer to Portfolio: Day in the Life Models.

Spin Users

Introduced to us by bike owners, Spin users became another primary stakeholder in our UCSD bike journey. Our conversations with this group of stakeholders was interesting because many of the points they brought up were also referenced by bike owners. Generally, Spin users valued the same two key points regarding the Spin rideshare service. Firstly, the flexibility and ease of use were very important to them. All Spin users appreciated the bikeshare community because they were able to use bikes when and where they wanted to on campus without having to worry about parking, bike security, or the overall maintenance of the bike. The second key point was the overall inexpensiveness of the service. Spin users rationalized that the service made it reasonable for them to commute around campus affordably, saving them time and money which would have been spent on either buses or Ubers.

Spin users were also quick to mention some key issues they found with the service. Most importantly, users complained about app/bike issues which plagued the overall effectiveness of the system. The app often crashed and many of the bikes had significant hardware issues. Many bikes had faulty seats, brakes, and gear shifters. All of these physical issues were concerning as they were also safety issues towards users and other humans on campus.

We were intrigued by how Spin users, like bike owners, often brought up bike parking. However, unlike bike owners, Spin users were all pleased with the self-locking capability of the Spin bikes and said that this feature made it convenient for them to park anywhere around campus. Based off of our interviews with bike owners, we were interested in getting Spin riders perspectives on where it was appropriate to park around campus. This question proved to be a point of confusion and contention for Spin users. Some Spin users claimed that the app instructed them to park near or at a bike rack (we were able to verify this claim), and thus they would try to park at a bike rack. Other Spin users said that they just

parked their Spins at bike racks because that was a reasonable place to park bikes. Finally, there was a contingent of Spin users who said that because there were no instructions on how to park Spin bikes, they would just park wherever was most convenient for them - while trying to be somewhat out of the way. Overall, the breadth of answers and confusion related to this question made it clear to us that the lack of clear bike parking guidance was a potential design problem. To see our day in the life model for Spin users refer to Portfolio: Day in the Life Models.

Pedestrians

This group of secondary stakeholders were found through our field research and were also mentioned by bike owners. We consider pedestrians to be a secondary stakeholder because they collectively do not physically use bikes on campus, but often have to interact with bikers and their parked bikes. During our field research we noticed that pedestrians often had to navigate through a mess of bikes outside of large lecture halls and at Library Walk. Based off of these observations, we spoke with pedestrians to understand their values and get their opinions about bikes on campus. Pedestrians were clear about their values- all they wanted was clear walkways and clear entrances and exits to classrooms to allow for the efficient and quick flow of traffic across campus. However, pedestrians noted that Spin bikes are often parked in walkways and at class doorways. These bikes often cause traffic jams/congestion and were tripping hazards. Overall, pedestrians made it clear that they didn't care about bikes and bikers until they disrupted their pathways. To see our day in the life model for pedestrians refer to Portfolio: Day in the Life Models.

Police / UCSD Administration

This group of tertiary stakeholders contained those who controlled and managed the Spin service on campus. We were able to talk to a few members of this group and found that they were also concerned with issues such as Spin parking on campus. Though the police were more engaged with cases where Spin bikes had been vandalized or misused, it was clear that Spin bike parking was a key issue for

this group of stakeholders. To see our persona for authority figures refer to Portfolio: Personas.

Design Problem

After identifying our stakeholders and discussing with them any positive or negative opinions about Spin bikes on campus, consistent problems that we found concerning Spin bikes were consequences of inappropriately parked Spin bikes, as well as Spin bike users struggling to locate a Spin bike to use. Of the two problems we noticed after interviewing our stakeholders, we decided that the main problem people generally had with Spin bikes was how they were being parked by Spin bike users. We decided to address this problem because it affected all the stakeholders negatively in some way. Photos of our observations of both appropriately and inappropriately parked Spin bikes can be found in Portfolio; Field Research Photos.

How Spin Bike Parking Affects Stakeholders

Because Spin provides Spin bike users a dockless bike, Spin bike users are given the freedom to be able to park anywhere in convenience to the user. Although this appears to be a convenient bike-share program, the convenience of the dockless feature of the bike provided problems to bike owners, pedestrians, and even Spin bike users themselves on campus. Since there were no assigned parking spaces for Spin bikes, we decided to observe where these Spin bike users would leave their Spin bikes after riding them. These observations were also done in an attempt to avoid bias; interviewees would be less likely to admit mistakes while being the focus of an interview. From our field observations, we observed that Spin bike users would park nearby their destination. These locations varied from outside classrooms, outside buildings, near bike racks, as well as in bike racks. While exploring the campus, we also recognized Spin bikes throughout campus that were parked in random areas that appeared to be not ideal spaces for Spin bikes to be parked. Such places included: in the middle of sidewalks, walkways, or bike routes,

car parking lots, and even intersections by stoplights. Interviews with our stakeholders can be found in Portfolio; Interviews.

Problems for Bike Owners

As previously mentioned, many Spin bikes were found parked in bike racks belonging to bike owners. Since Spin bikes can all be parked in any locations without a bike rack, it is unnecessary for Spin bikes to be parked in bike racks. While Spin bikes are being parked in bike racks, this has become a nuisance to many bike owners. Majority of the bike owners we interviewed stated that they were very annoyed by Spin bike users parking in bike racks. Bike owners are constantly having to remove the heavy Spin bikes from the bike rack and carry them somewhere else out of the way while also having to hold their own bike. This has become routine for bike owners and is a “complete waste of time”. This was a problem consistently mentioned by bike owners, who complained of Spin bikes being parked in designated bike parking.

In addition to Spin bike users parking their Spin bikes in bike racks, some Spin bikes were also found in the middle of or at the end of bike routes. This could be due to Spin bike users intimidated by the uphill slope of the bike path, thus causing them to leave the Spin bike at the end of or in the middle of the bike route. Not only were these parking locations non-ideal for bikes in general, they were also dangerous to those riding on the bike routes. As most of the bike routes at UCSD are sloped, bike owners tend to ride bike routes at high speed when going downhill. Inability to see a Spin bike on the bike route can cause collisions. Some bike owners have admitted to almost hitting Spin bikes left at the end of bike routes, and some have also admitted that they have had to slam their brakes to avoid crashing into a Spin bike.

Problems for Pedestrians

As many Spin bikes that were not in use were located all throughout the school campus, many were found in the middle of sidewalks and walkways. These are the

main pathways that pedestrians take walking around campus to get to their destinations, whether it is classrooms, dorms, dining halls, or meeting up with other friends. Although pedestrians have more flexibility with dodging obstacles because they are able to move around easier and much safer than bike owners are, it was reported that it is still a nuisance to pedestrians when Spin bikes are parked in sidewalks and walkways. Having the freedom to walk on any platforms, pedestrians often like to cut corners or take shortcuts. With Spin bikes being parked on sidewalks and walkways, pedestrians find it harder to get to places they would like to be because they would have to be cautious of Spin bikes in their way. Not only is this a nuisance to the pedestrians, but it is also a danger to those that share the walkway. As observed everyday, many people distract themselves while walking somewhere; most of the time people are on their phone or are listening to music and not paying attention to their surroundings. Assuming safety on walkways, it is possible that pedestrians can collide with Spin bikes because they are obstructing the walkway.

Problems for Spin Bike Users

The way Spin bikes have been parked around the UCSD campus have proven to be problematic to both bike owners and pedestrians, but we also found Spin bikers who had complaints regarding how Spin bikes are being parked. Because Spin bikes have sometimes been found in random locations, it actually makes it harder for Spin bike users to locate a Spin bike to use. As some Spin bike users regularly park Spin bikes outside classrooms, some other Spin bike users find this convenient because they like that the Spin bike was readily available for them right when they get out of class. However, the dockless feature of the Spin bike makes it less reliable in a sense where it makes it hard to locate them at times. Along with a faulty app, some Spin bike users have admitted that sometimes Spin bikes are out of reach and not easily accessible. Especially since people generally use Spin bikes to get to places faster, more time is wasted on the first step of locating a bike to use.

Design Process Phases

Initial Brainstorming

By starting with a bottom up approach, we looked into potential issues we see on a daily basis on the UCSD campus. Originally, our group had initially targeted patient environment with the hospital; but found that access to the stakeholders without infringing on privacy rights or health laws was very restricted and would provide us enough evidence based data we would need to help us understand the complications. So instead we narrowed our scope to a more accessible population on UCSD campus. There was common experience amongst our group when it came the nuances for Spin Bikes. To affirm that this was indeed a common issue, we began to interview and observe people around campus for our identified stakeholders, refer to (Portfolio; Interviews). In addition, we found many supporting articles and posts on the complications pertaining to the Spin Bikes. As Spin bikes were relatively new on campus, there was still a lot of room for improvement in its integration on UCSD campus, and therefore found Spin Bikes an appropriate project idea.

Human Evidence Based Data

Rather than using a top down process, as previously stated, we looked into a bottom up approach so that the complications we may see with Spin Bikes directly arises from our stakeholders. To start this process, we began to conduct interviews among out stakeholders. While interviews proved useful for our secondary and tertiary stakeholders, for our primary stakeholder, it was difficult. Often times, to identify these riders, we had to see that they were in interacting with the Spin Bike in some way. However, this also usually meant that they were you using the bike to get somewhere and did not have the time to be interviewed as they were trying to get to class. So interviews for Spin Bikers ran short. This was when we began to incorporate field notes and the observational descriptions with images to

supplement our data. In addition, we would ask people around campus if they used Spin Bikes so also find users and be able to have time to interview them. In addition, we also looked at the behavior of Spin Bikes itself, such as location tendencies found on the Spin app.

Affinity Diagram

While gathering all of our interviews and observational notes, we began to create an affinity diagram. By going through our interviews and field notes one by one, we created sticky notes for any identified problem from our stakeholders. When creating this diagram, we found many similar issues being identified across our stakeholders across both interviews and field notes. Initially, we were given feedback that our data collection was too small and narrow. We felt our information condensed quite a bit but we didn't wish to leave out or restrict our scope for Spin Bikes. We wanted to ensure we had all of the human evidence based data to get better results when we would later ideate a solution. So we not only looked into issues of Spin Bikes, but also the positives surrounding the Spin Bikes. We didn't want to change something that would affect the positives effects of the Spin Bikes being on UCSD campus. In addition, though the class provided we should not recreate an app, we did provide complaints about the app within ur affinity diagram to further understand what tools used the environment when paired with the app, could be beneficial.

When we looked at our data, we found common categories and color coordinated to provide us a better picture on how it all fits together. Common categories included: annoyances, hardware, positives, confusion, dangers on the road, parking, spin app, and police/administration. To see our affinity diagrams, refer to (Portfolio; Affinity Diagram).

Design Models

With the use of evidence and observation, we were able to create Day in the Life models of each of our stakeholders to analyze their daily lives. Now that we have identified issues (provided under design problems) commonly occurring amongst our stakeholders, to gain insight as to our stakeholders interaction with the targeted issue -Spin Bikes- we created design models. We particularly focused on Day in the Life Models, Identity Models, and Personas for each stakeholder. These design models can be found in (Portfolio; Design Models).

We figured by creating a Day in the Life Model for each stakeholder, we can see the daily lives of stakeholders at UCSD. Ultimately, this allows us to see how Spin bikes impact the daily likes of our stakeholders. What we saw for the Day in the Life Model for a Spin user is that they placed Spin bikes in locations that would most enfit them and work with their schedule and convenience. A spin bike inappropriately parked would delay the Spin bike locating process as well as decrease the value of convenience for Spin bike users. We also found in the Day in the life of a bike owner that bike owners used their bike to transport themselves places as fast as possible. They prefer riding their bike because it is a fast alternative mode of transportation. With a Spin bike parked in the bike rack or obstructing bike routes, this causes some traffic and adds additional and unnecessary time spent on the bike for the bike owner. Finally, in the Day in the Life of a Pedestrian, we found that pedestrians like to take safe and quick routes to their destination. An inappropriately parked Spin bike would lower pedestrians' access to shortcuts and also decrease the safety of the walkways by blocking sidewalks and walkways. In conclusion, the Day in the Life models were used to immerse ourselves in the shoes of our stakeholders, allowing us to see how their daily lives could be impacted by Spin bikes.

By using Identity Models and Personas, we highlighted motivations based on our stakeholders values. For a Spin user, by looking into what there reasoning is behind using a Spin Bike, we find how behavior corresponds with their values. It

highlighted how Spin Bikers valued convenience; their reasons to use Spin Bikes were to have fast transportation at a low cost without having to worry about maintenance. Convenience also shows in the way they park their Spin bikes as Spin bike users park in ways that are convenient to them. In the case of a bike owner, they valued their space for their own bikes. With bike racks already being reported as scarce and having to share bike routes with pedestrians who like to take shortcuts, bike owners constantly struggle with finding parking and therefore value their space when parking their bikes and riding their bike routes. With pedestrians and police, there was a high prioritization of laws and potential safety issues or obstructions that could potentially be caused by Spin bikes.

So we moved from human based data collection to commonly identified issues, and then to values influencing these stakeholders. But to find that connection between values, behavior, and the targeted problems, we needed some context. This was done via storyboards.

Storyboards

Here is where context now comes into play; through storyboards we could clearly see the relationship where values influence problematic behavior. By using the evidence based data collected to identify the targeted issues, we built the context for different scenarios across all stakeholders based on values identified in the Design Models. To see all completed storyboards, refer to (Portfolio; Storyboards). Bike owners were given a scenario in which there value for space was being infringed upon while Pedestrians had their values of clear walkways and safety regulations violated. These issues caused because a Spin Biker behavior in a manner that displays their value for convenience.

All issues presented by storyboards described situations in which there was an infringement on other stakeholders values by Spin Bikers behaving in accordance with their value of convenience. We needed to come to a resolution where there is consideration of other stakeholder values.

Therefore, we came up for possible solutions based on certain circumstances of inappropriate Spin bike parking. The storyboards for the desired resolutions were human evidence based. When creating the story boards, we again found this convergence of data in which some solutions seemed to work for multiple issues and resulted in similar resolutions. Particularly, the solution for a designated parking location for Spin Bikes seemed to be the most effective based on the assumed outcome. But this would be after put to the test when we ideate and implement our prototypes.

Ideating / Prototyping Process

The prototyping process broke down into six main steps for us (each included storyboards, interviews and testing): initial location finding and five main iterations. Below we go in-depth into each step.

Ideation

During the ideating process, we decided to base our prototype off of convenience, safety, and space; we identified these values in the process of making the Identity Models, Day in the Life Models, and Personas that we created for our stakeholders. In an attempt to regulate Spin bike parking at UCSD, we managed to think of some potential ideas, including: designated parking spaces and signage in popular Spin parking locations as this seemed most suitable and appropriate to serve the values of our stakeholders; we noticed this while making our storyboards Paying attention to the resolutions of the storyboards involving designated parking spaces, we took the most common solution and began to formulate ideas for our prototype. This prototype idea would provide Spin bike users convenience since the designated parking spots would be near popular locations. This is evident by the map given by the Spin App showing the location of all Spin Bikes. We decided that the designated Spin bike locations would be separate from the personal bike racks. Sharing the space would cause Spin biker users to have to go through several bikes to grab a

single Spin bike. Bike riders would benefit from this idea by having more space to park their bikes without any hassle of moving Spin Bikes out of the way (explicitly stated within our interviews and from our observations at the bike racks). Pedestrians benefit by walking to their destination smoothly without the need to overcome any obstacles or hazards caused by the Spin Bikes.

After converging on designated parking spots for Spin bikes, we were originally considering placing a giant, orange sheet of construction paper adjacent to bike racks. The intent of this was to indicate to Spin bike users that this is where Spin bikes may be parked appropriately, without having to directly say “Spin Bike Parking”; this is also known as a thoughtless act. This idea was flawed, however, because of the weaknesses in the material of the paper and its size. Adhering paper to the ground to designate parking would not work well since paper could easily be destroyed by people, dirt, weather, and it would be very easy to remove. Paper would also be an improper size; we would need a large supply of orange paper to designate parking, which would be very temporary since large amounts of paper on the ground can easily be ruined. We later changed our ideation process towards chalk.

Moving on from paper, chalk was also a possible medium that could be used to implement our prototype of designating parking for Spin users. Although chalk is a less temporary medium than paper, it is also less legible. The medium itself produces a thin line that would require numerous coats of chalk in order for an image to be visible from a distance. Also, adding numerous amounts of chalk could bring forth more illegibility. With time, chalk also fades away, making it less clear and legible, again. Overall, chalk is not a reliable medium that we should use to implement parking. Most found that chalk would not withstand the weather, and would smudge easily when bikes, scooters, skateboards, feet, and vehicles come in and out of the area. People wouldn't care to park there if it doesn't seem like it was

a meticulous, organized, and clean area. Essentially, we found that after discussing these ideas amongst our group and amongst our stakeholders, the two things we need to look at is clean legible lines and durability for longest possible solution that could be easily removed by us in case the prototype needed adjustment.

Ruling out paper and chalk, we decided that duct tape was feasible for this prototype when a team member mentioned using tape to help create straight lines on her graduation cap. Duct tape was easy to obtain and we did not need a large supply, like we did for paper and chalk. Instead of making a shaded box made of orange duct tape to signify designated parking, the duct tape was used to outline a box where Spin bikes would be placed inside. This idea would be noticeable enough from a distance and the quality would not degrade as fast as the quality of paper or chalk. It would also allow for very nice straights lines to be created to give it that "official" feel. Sketches created throughout our ideation and prototyping process can be found in (Portfolio; Prototype Sketches).

Initial Location Finding

The first step in our prototyping process was determining regions on campus where our prototype could have the highest impact. We found these locations through interviews and by examining the density of Spin bikes around campus through the map of Spin bike volume provided by the Spin app. Through user research we found that pedestrians and bike owners ran into issues with Spin parking at Library Walk and near large lecture halls. In addition, based off of data from the Spin app, we were able to confirm that these were high traffic regions because there were almost always multiple Spin bikes parked in these locations. We thus chose Geisel Library as the first location we would test our prototype since we saw many Spin bikes located in this area of campus. Photos and videos of our prototyping process can be found in (Portfolio; Prototype Videos / Photos). Field notes taken during the prototyping process can be found in (Portfolio; Field Notes).

Prototype 0 - Control

Statistics

- 4 Spin bikes parked in bike racks
- 2 Spin bikes randomly parked

Evidence

https://youtu.be/Kziog_AWh4o

Observations / Interviews

Prior to beginning of our Prototype 1 tests we observed the distribution of Spin bikes outside Geisel for 30 mins and noted that there were 4 Spin bikes parked in the bike racks and 2 Spin bikes randomly parked. Also pedestrians had mentioned that based on our sketches of our prototype there might be some intrusion into the walkway. We were able to validate these concerns and made a micro-location change still outside of Geisel Library. Based off of this feedback and iterations we decided that it would be appropriate to physically implement this Prototype 1 design solution.

Prototype 1 - Orange Parking Zone (Geisel)

Statistics

- 0 Spin bikes parked in orange zone
- 6 Spin bikes parked in bike racks
- 1 Spin bike randomly parked

Evidence

https://youtu.be/Kziog_AWh4o

Observations / Interviews

Our Prototype 1 tests were unsuccessful as Spin bikers continued to park in the nearby bike racks and randomly outside of Geisel. We observed riders pass/ignore our orange parking zone for about 45 mins before going to speak with the Spin riders who were parking near Geisel. During our interviews with Spin riders and pedestrians, there were four main issues which were brought up about our design implementation. Firstly, riders said that they did not understand the function of the orange box and thought it might be a construction zone or place they were not supposed to enter. We asked these users how their decision would be influenced if there was already a Spin bike parked in that location and they responded that this would signal that the orange taped off region was an appropriate place to park Spin bikes. Secondly, the Spin bikers who parked in the bike racks said they preferred that location because it was closer to the classrooms, compared to where our Spin parking zone was. This statement tied into our third issue, which we noticed through observation and interviews, that most Spin bikers parking near Geisel were not actually looking to go to the library, but were instead heading to a classroom or Price Center. We began to discuss potentially changing the location of our test to focus more on parking outside of high use lecture halls. Finally, some riders and pedestrians mentioned that they had not even noticed the orange tape and thought that the box we had created was too big for the amount of bikes that usually were near Geisel.

Based on these results and the interviews that can be found in (Portfolio; Interviews), we conceptualized a couple iterations to our design. Firstly, we determined that placing a few Spin bikes into the orange zone would help users recognize that it was appropriate and correct to park their Spin bike there. This would a second implementation of a thoughtless act. Secondly, based on responses that the box not noticeable (it was too big to take in visually), we discussed that if we made the box smaller, it would be visually highlight the area as the concentration of orange tape in the area will have increased. Finally, we began

to look for other high use spaces near classrooms, which could potentially be a more feasible place to implement our solution. However, for our Prototype 2 we decided to only iterate by adding Spin bikes into the orange zone because we wanted to know exactly which variables contributed changes to Spin bike parking and we wanted to minimize the extraneous variables.

Prototype 2 - Orange Parking Zone + Spin Bike (Geisel)

Statistics

- 4 Spin bikes parked in orange zone
- 4 Spin bikes parked in bike racks
- 3 Spin bike randomly parked

Evidence

https://youtu.be/GspiCWEqgME

Observations / Interviews

After aggregating the suggestions and input from Spin riders after our Prototype 1 test it was evident that we needed to make the Spin parking zone more obvious. Thus to make it clear that the orange parking zone was meant for Spin bikes we parked a Spin bike in the zone prior to beginning data collection. The results from this test were somewhat encouraging as three Spin users parked their bikes in this region, but seven other Spin users parked their bikes in the bike racks or randomly outside Geisel. At the conclusion of the 45 minute observation period, we went to speak with our stakeholders and get their feedback towards our solution. The feedback we received from Spin users mainly boiled down to three major issues. Firstly, as reflected in the Prototype 1 feedback, users again told us that they did not park in the orange area because it was not near their classes and thus they decided to park in the bike racks. Secondly, some Spin bikers mentioned that while riding the bike they did not notice the box or bike. Although, most of these

interviewees said that they would have parked their bike their if they had noticed it. Overall, it was becoming evident that our location outside Geisel Library was not optimal for Spin riders, due to most riders needing to primarily class while using Spin bikes, this location and devalued their importance for convenience.

Based on these interviews and field data we came up with a few new iterations of our design. The first idea, to resolve the issue of bikers finding the location of the Spin parking space as inconvenient, we determined that it would be more appropriate to place these zones outside of high traffic lecture halls (Image 8 in the appendix). This was also reflected during our Prototype 1 testing. Secondly, we determined that by adding more bikes/increasing the concentration of bikes in box Spin riders would be more likely to notice these spaces. Decreasing the size of the box would also increase concentration of the orange tape in a given area, therefore salienting the designated parking area. While these were major issues that would have to be resolved, almost all Spin users stated that the orange zone seemed like an appropriate place to park the Spin bikes because there was already a Spin bike there (the thoughtless acts seems to provide better results). Because the major complaint we faced during this/the last round of testing was the inconvenience of the parking location we decided to iterate in Phase 3 by moving the location of our Spin parking region.

Prototype 3 - Orange Parking Zone + Spin Bike (Warren Lecture Hall)

Statistics

- 7 Spin bikes parked in orange zone
- 0 Spin bikes parked in bike racks
- 0 Spin bike randomly parked

Evidence

Before After

Observations / Interviews

From our Prototype 1 and 2 interviews it became clear that our current test location at Geisel was not appropriate for our stakeholders and a parking zone near a high use lecture hall would be more appropriate. Based on our field observations we noticed that the highest density of Spin bikes were on the lower elevation East side of the campus. Thus, we choose Warren lecture hall as the next location to test our concept. We choose this lecture hall because of its location on campus and because during our field research, we found that Spin bikes were often parked haphazardly and in bike racks near Warren Lecture hall. Prior to physically implementing our solution, we sketched out models of potential locations and asked our stakeholders for their initial feedback. Bikers and Spin riders both commented that the area depicted in our first ideation would both interfere with bike owner parking and also be inconvenient to Spin users who were in a rush. Thus we changed this location and got positive reviews from all of our stakeholders. We then implemented the solution in this region and observed the results.

The results we witnessed were very encouraging. Many Spin riders parked and took bikes from our orange zone and not one Spin bike was parked in the above bike racks or the nearby bike racks. Also Spin riders seemed to be encouraged to park their bikes more neatly in the orange zone thus making it more safe for other Spin users. After we completed our observations we talked to bike owners who commented that they loved how the Spin bikes were not longer in their way and taking up their precious bike racks. In addition, pedestrians commented that the bikes no longer blocked the exits and caused traffic jams when entering or exiting class (in addition to no longer being fire hazards). Spin users also liked this solution as it was both close to their classroom and also allowed them to easily find a Spin bike after class. However, they also mentioned that they were unsure how this solution would work around the rest of campus and also thought that the parking region at Warren Lecture Hall could have been larger.

Prototype 4 - Orange Parking Zone + Sign (Warren Lecture Hall)

Statistics

- 3 Spin bikes parked before sign was implemented
- 5 Spin bikes parked in orange zone after sign was implemented
- 0 Spin bikes parked in bike racks
- 0 Spin bike randomly parked

Observations / Interviews

Before the sign was added to the orange parking spots, many Spin users informed us that they could not find the parking spots that we had created for them to use and ultimately still ended up parking in the bike racks which we were trying to avoid. We decided that the next best thing for us to do would be to enact a sign such that it would make it clear exactly where the spot is and what it is for. We also narrowed down on location from here such that we get more consistent results. Warren Lecture Hall was the most successful whereas Geisel was hit or miss and

very inconsistent. We created 2 different signs to see which would work best. Our first sign was an orange sheet with a bicycle inside following the color theme of Spin bikes. The second sign stated: “Park Spin Bikes Here.” After we added our first sign, we found that after an hour, only 3 bikes had been added. The second sign was much more successful. After adding the second sign to both the wall of Warren Lecture Hall 2001 and the ground, we found 5 bikes parked within the parking spot. The next biggest thing we noticed as well was how there were no Spin bikes parked in the area surrounding our parking spot showing how everyone who was going to that area was parking in our parking spot.

When we interviewed users to gauge their thoughts on the sign. Many of the pedestrians told us that the sign didn’t make much of difference to them since they would not utilize it anyway. They only noticed the spot when there were Spin bikes parked inside it. However, some thought it was cool that there was a designated spot for the Spin bikes. As for the Spin riders, they noticed the signs in general but only if they were already going into the space to park their bikes in the first place. They said the sign was not visible from a distance, and that the reason they know to go towards the area is because other Spin Bikes are already parked within that location, hence, they also know that function of the orange tape is for Spin Bikes. Overall, adding a sign did not seem to make a difference as it was not visible, and the organe tape seems to be enough if there was already Spin Bikes parked there, highlighting the designated area and its function through thoughtless act.

Final Design Solution

The best final design incorporates the values of all of our stakeholders. With that in mind, we made sure that our prototype was near high Spin traffic areas so that more Spin bikers would use it. It would also need to be out of the way of sidewalks and major walkways such that the Spin bikes are not hazardous or cumbersome by blocking pedestrians and bike riders. The prototype would also need to be out of bike racks but still near them. Bike riders dislike when Spin bikes are left in the

racks as they do not need to be locked and ultimately end up blocking valuable bike parking spots. And finally, after several iterations, the prototype would need to as close to classrooms as possible. Spin riders used the parking spots near lecture halls much more than the spots near Geisel and many told us that they appreciate a parking spot closer to lecture halls.

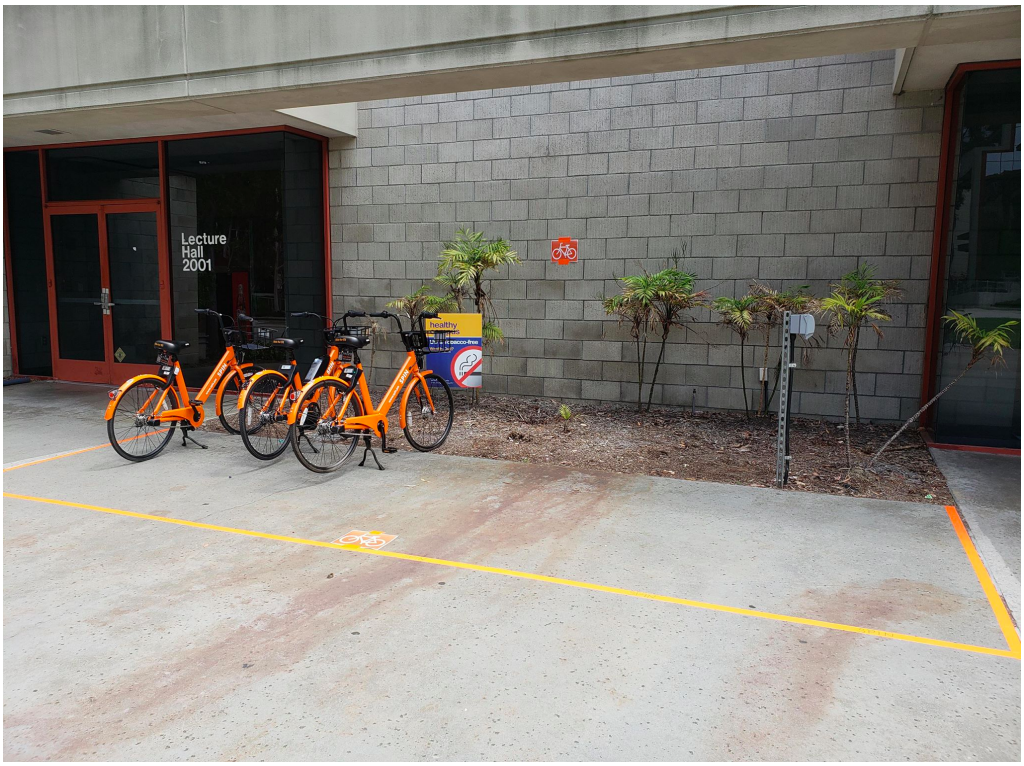
We first had to designate an area for the Spin riders to use and a way to mark that area. We decided to use orange tape as a prototype to outline a large box that Spin bikers would park their bikes within. We also found that users had a hard time understanding what the parking spots were for when there and thus we created signs to indicate exactly what the boxes were for.

We found that Spin riders greatly appreciated the close proximity to classrooms and the reliability of finding a bike. The bike riders appreciated that Spin bikes were no longer blocking their parking spots and pedestrians were no longer facing the dangers of terribly parked Spin bikes.

On our first day of implementing our prototype at Warren Lecture Hall, we found great success. Before implementation, only 3 bikes were in the parking spot which were placed by us. After one hour, there were 5 bikes in the parking spot. We also observed many people utilizing the already present bikes in the parking spots. The biggest success is the fact that there were no bikes present around the area where our prototype was implemented meaning all of the bikes that would have been parked around Warren Mall were being parked in our parking spots.

Though originally we believed our final prototype for a designated area for Spin Bikes with the signs tested in Prototype 4 would be enough, we found through human evidence based data we still needed some improvements. Unfortunately, since the class is on a time constraint, and materials needed would not be immediately accessible, our ideation for a better prototype than protype 4 was not tested. Had we had the time and materials, our final prototype would have consisted of a designated Spin Bike area in high traffic areas near classrooms

outlined by orange tape in a safe space for all stakeholders, with a sign visible from a distance. Our design solution is ultimately an orange highlighted zone dedicated to idle Spin bikes as well as an orange bike statue to help propagate thoughtless acts even when no Spin Bike is present within the area.



Key Insights

When we first started this group, we were a team of three looking to tackle common medical issues especially the check-in process within clinic waiting rooms. We found this project focus far too broad and complicated for a small team to develop and do well and thus we decided to completely change our area of focus. We found that in order for our team to do well, we had to focus on an area with plenty of stakeholders that were willing to share their ideas as well as something that we found to be a problem around campus and from that we decided to tackle the problems with Spin bikes.

A great discovery that we made during our prototyping phase was that many people found our prototype helpful in a way we did not predict. The Spin riders appreciated how it was much easier for them to find a Spin bike and how close they were. When we began prototyping, our main goal was to have a dedicated area for them to park their bikes to keep them from blocking major sidewalks and pathways and in doing so, we missed the fact that they valued reliability. By understanding that the Spin riders enjoy and value having a bike much closer to them in an easy to find location, our next iterations would be smoother and much more successful.

Roadblocks

Right from the beginning one the main problems we were running into was interviewing one of our main stakeholders; Spin riders. There are two ways of knowing right away if a person is a Spin rider: when they are riding a Spin bike and when they standing next to one getting ready to use it. When a person is using a Spin bike, they are usually in a rush to get to their destination and do not want to be stopped to answer a few questions or they do not want to run their clock and have to pay more by having a bike out for longer periods of time. It is also hard to

interview a person when they are riding a bike and going away. We decided that the best thing that we could do was take a copious amount of field notes and observations. For many days, we went out looking for any Spin bikes to see how and where they parked. This was helpful but still not enough. We created a few quick and easy questions and as people finished parking their Spin bikes, we would quickly ask the questions to understand their decisions. This was far more time consuming but definitely much more helpful and insightful.

Another roadblock we encountered involved data and evidence. At first, after we had created our first affinity diagram and gathered our initial data, we assumed that we had enough data; however, that was not the case. We did not know exactly how much data we needed and thus did not have enough. It was not until later when we gathered every bit of data that we realized how important having a lot of data and evidence was. When we gathered a lot more data, our final prototype was much easier to create.

Lessons Learned

When we created our first prototype models, we had several ideas in mind of what we thought would work best. As we began to prototype, we quickly realized that our proposed solution would not work and that we had to rely much more on gathered evidence from our stakeholders to get to a functional prototype. As soon as we did this, our prototype showed a huge amount of success and worked great. We learned that it is great to ideas as long as they are backed up by evidence from our primary stakeholders. We also found out that there will always be viewpoints that will be missed unless prototyping with actual primary stakeholders occurs. We didn't realize how convenient the location of the Spin parking was for Spin riders until many informed us of how greatly they appreciated the close proximity of the bikes in their designated spots.

Another thing we learned after several weeks was how impactful asking the right questions is. In the beginning, we asked very simple questions which did not give us

any important insights into the problems that people were having and instead we were looking for validation for things we notices. As we evolved we started to change the questions that we asked and started to understand what our major stakeholders valued the most. This allowed us to find a solution that is very successful.

Evaluation of Success

After a few rounds of prototyping and iterating, we deemed our prototype overall to be successful. As mentioned previously, our final design solution was to create a designated parking spot for Spin bikes by highlighting an area with an orange outline and providing a clear functionality with signs to indicate to passersby that the outlined area belongs to idle Spin bikes. Though our signs were deemed irrelevant, overall our solution helped decreased issues amongst our stakeholders values.

Our goal was to regulate the Spin bike parking as there was little to no regulation of the parking on the Spin app itself. Although there was some verbal guidance on the app on where to app, its efforts were weak. By highlighting appropriate places on the UCSD campus for Spin bikes to be parked, attempts to regulate how Spin bike users were parking their bike were successful. This was proven to be true by our prototyped parking spot implemented in Warren Lecture Hall. Ultimately, the orange outline to designate Spin bike parking would serve to reduce confusion for Spin bike users who are unsure of where to park and minimize the abnormal parking around the UCSD campus. While analyzing this final design solution based on our prototype in Warren Lecture Hall, we found that the designated Spin bike parking spaces were helpful in some way to all our stakeholders; this was confirmed by our interviewees upon asking them if they thought the orange outlined box were helpful to them at all.

Again, as mentioned previously, if we had the time and materials to further improve our final prototype with a more visible and clear sign with an orange bike statue, we would implement this and expect an even greater success. Luckily though, we found that the UCSD department that cooperates with bike share programs had actually created a parking space near Gilman Parking Structure that appeared to be identical to our prototypes. Similar to our prototypes, they used orange duct-tape to outline a box where Spin bike users would park their bikes. Also similar to our prototype, they had incorporated a sign with their outlined parking space along with a notice to Spin bike users to avoid riding their Spin bikes off campus. But their sign was much more visible from a distance. We found this Spin parking space after we prototyped our design solution to regulate parking. After seeing that our idea was actually implemented by the UCSD bike share department, we feel more confident that our design solution was successful in addressing the Spin bike parking problem.

Addressing Stakeholder Needs

In the midst of our prototyping process, we interviewed stakeholders that were nearby or interacted with our prototyped parking space after seeing successful interaction with the prototype in Warren Lecture Hall. As we sat and watched from a distance, we saw several Spin bike users interact with the parking space, whether it was them parking their Spin bike or taking a Spin bike already in the parking space. All Spin bike users we interviewed found the highlighted parking space we created to be helpful to them because they were able to easily park their bikes in front of their classroom; they were also able to easily locate a Spin bike to use after their class was over. Our main intention was to regulate the Spin bike parking to reduce the clutter and hazards that came with abnormal Spin bike parking; however, it was an added bonus that we were able to help Spin bike users find Spin bikes without using the Spin app. The Spin app had a reputation of being very laggy, buggy, and riddled with problems throughout. Without altering the app itself, we were able to help Spin bike users quickly and easily get through the first step of the rental process -- finding a Spin bike to use. Our design solution also sped up the Spin bike rental process by providing parking spaces that would be in ideal locations close to existing bike racks that were easy to find. With these parking spots, Spin bike users spend less time wondering where to park their Spin bikes and in the end, they park in appropriate locations that don't disturb or disrespect the values of other stakeholders.

While we fulfilled the needs of convenience for Spin bike users, we also fulfilled the needs of space of bike owners. The main complaint of Spin bike users with Spin bikes were that Spin bikes were always being parked inappropriately in bike racks or in the middle of bike routes. After implementing our prototyped Spin bike parking space, we asked bike owners how they felt about the designated Spin bike parking space. The results were positive; bike owners that had class in Warren Lecture Hall were fond of the fact that there were no longer Spin bikes left in the

bike racks after we had placed the Spin bike parking because the Spin bikes were now being parked in the orange zone we highlighted. We had only prototyped in Geisel and Warren Lecture Hall, so we believe that more bike owners would share this opinion if more of these Spin bike parking spaces were implemented in various locations throughout the UCSD campus. We also believe that if we increased the quantity of these designated Spin bike parking spaces, we would be able to implement them near bike routes to reduce the hazardous parking of Spin bikes on these bike routes.

Not only were the needs of convenience for Spin bike users and needs of space for bike owners were fulfilled, the needs of safety and time for pedestrians were also fulfilled. Much clutter of Spin bikes existed near Geisel and Warren Lecture Hall, where we decided to prototype our design solution. With a lot of clutter of Spin bikes in the middle of heavily populated sidewalks and walkways, it causes more traffic and brings more danger to pedestrians who are walking on these sidewalks and walkways. Previously, Spin bikes were parked in the bike racks at Warren Lecture Hall, which was an inconvenience for bike owners. After bike racks had been full of personal bikes and Spin bikes, the Spin bikes were ultimately littered onto the sidewalks because there was no other space for these Spin bikes. In a high traffic area like Warren Lecture Hall, excess Spin bikes on the walkway cause more traffic and danger to those were unable to see the Spin bikes obstructing the path. After we had separated the bike parking and Spin bike parking by prototyping our design solution near Warren Lecture Hall, there was no more clutter of excess Spin bikes spilling onto the walkways. Upon asking pedestrians how they felt about the Spin bike parking, some didn’t even notice that there was a designated space for Spin bikes to be parked simply because the had no use for the spot. However this benefits them because they did not slow down or collide with an inappropriately parked Spin bike. Other pedestrians noticed this and thought it was helpful for everyone that the two bikes were separated by parking spots. Ultimately, our design solution allowed a smoother travel to their destinations.

Possible Future Work

While we do believe our final solution solved many of the Spin parking issues near lecture halls on the UCSD campus, there is still more work we want to do in the future. Though we identified lecture halls and Geisel Library as two hotspots for incorrect parking activity, Spin bikes are also parked inconveniently in other places across campus. In the future we would love to work with the Spin Company to design potential solutions which would encourage users to park their bike correctly everywhere on campus. This could potentially be through improved in-app parking guidance, allowing users to rate another's parking, or fines/penalties for users who park in pathways/bike racks. We believe that a campus wide solution is possible if the school is able to work directly with the Spin company.

We were also very interested in testing a couple of other iterations to our project which included larger signage that would be visible from a distance and mini-zones in regions where we notice small amounts of Spin bike parking. Though we mainly focused on Spin parking hotspots around campus it would have been interesting and informative to see if our solution worked in low Spin traffic regions. In addition, as mentioned previously, we would like to have a orange bike statue in the designated area to facilitate the thoughtless act in case all bike are not within the area.

While this project was ongoing we began to read news articles about cities like San Francisco running into parking problems with Spin, Bird and Ofo bikes/scooters. In fact last Monday (June 4, 2018), San Francisco banned all bike/scooter-share companies from operating within its city limits until it can come up with safe ways to regulate parking (Wired and LA Times). We believe that are IDEO inspired thoughtless act solution would be a cost-effective and efficient way for cities to improve bikeshare parking and would love to test our prototype in an off-campus setting.

Reflection

Throughout this project on regulating Spin bike parking, we learned that bike-share programs themselves have flaws that can be kept under control by users. Although Spin is a company that lends out these Spin bikes, the flaws that arise from the Spin bike-share program are a result of human activity. Humans tend to make decisions based on what is most convenient to them. As Spin may appear to be a convenient program lending out dockless bikes, many flaws are associated with it due to its participants. We found that this flaw of human activity can be kept under control with subtle alterations, such as applying an orange outline to signal to other humans that this outlined space belongs to the orange Spin bikes.

From the human-centered design experiment that we performed on our stakeholders, we learned that there is never enough evidence as every single person may have different opinions. Each opinion holds value, but it is not possible to gather opinions from an entire population; it is only possible to perform evidence based design on a sample. We also learned that the human centered design process is a time consuming process that requires patience and complete focus. In a ten week time period, it is difficult to gather “enough” data to conjure up a human-centered design solution. Had we been more prepared, our schedule could have been more organized to cater to as many people as possible. Additionally, we also learned that there is no design solution that has a “one size fits all” component. There will always be an edge case that can’t be solved. Although we converged on a final design solution to regulate Spin bike parking, this solution could vary based on location. As a result, there never really is a “final” solution, as these design solutions can be constantly iterated on and improved to cater to every stakeholder.

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