Final Report: WalkMate

The Team

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Problem and Solution Overview

The community we are targeting to help with our project is professional dog walkers. Their work is important because walking a dog is essential for its health and wellbeing, and not all dog owners have time to walk their dogs. Sometimes, problems arise in unpleasant situations during the walk. We want to minimize these unpleasant situations and enable dog walkers to easily keep track of the dog (or dogs) under their supervision and optimize the walking experience. The more control we give to dog walkers, the more effectively they can tailor a walk to a specific dog's needs, and the more the dog will benefit. To solve this problem, we are proposing the WalkMate, a device the clips on to the dog's collar that will provide useful functionality necessary to optimize the walking experience. You will be able to keep track of the dog's health, find and mark points of interest on a walking route, and receive path suggestions for the walk. WalkMate will enable dog walkers to attend to multiple dogs at a time. They can avoid places that are deemed undesirable by taking into account the dogs' behavior and track the dogs' health in order to give them the right amount of exercise. With a compatible scanner, all the necessary information will be at the fingertips of the dog walker.

Design Research Goals, Stakeholders, and Participants

For our design research, we focused on conducting surveys and interviews. We choose these methods due to a combination of factors. These include time constraints, the desire to reach a large sample size with limited mobility, and the desire to collect firsthand information about our target group and interact with them directly. Conducting surveys allows us to efficiently collect information from diverse samples of our target group in the short period of time we have and get information about their thoughts, perceptions, and what they view as problems. Of course, surveys aren't always 100% reliable, so we augmented these surveys by conducting interviews. This allowed us to interact directly with our target group and collect firsthand personal accounts of their experience and perceptions. We also learned about a more diverse array of stories and circumstances this way than if we had just shadowed one dog walker. Doing interviews in addition to surveying humanized our target group and allowed us to truly build empathy with professional dog walkers.

Our target group of users for this project is professional dog walkers. The goal of our project is to minimize unpleasant interactions and events that occur during a dog walk. While there may be other potential stakeholders, like dog owners and the dogs themselves, we mainly wanted to collect information about the problems experienced during dog walks directly from the professional dog walkers. These problems could include crowding, the schedule of walking, traffic, or any other

inconvenience encountered on a walk. We also desired information about the things professional dog walkers wished they had during the walk. Professional dog walkers often walk multiple dogs at once, so finding information about how they deal with that could be valuable. We engaged with our target participants through calling and emailing. We intended to contact agencies around the US (like Fetch! Pet Care and Wag!) to get perspectives from professional dog walkers in various cities. These interviews were conducted on the weekend of January 27th/28th.

Participant 1

Participant 1 is professional dog walker who works for an app called Wag!, which is essentially Uber for dog walking. He lives in Chicago and is a student who does professional dog walking in his spare time to earn extra cash. We interviewed him remotely, and he really loves dogs and walking them. He also has dogs of his own and clients' dogs that he walks regularly, and mentions it is easier to walk dogs that are familiar to him.

Participant 2

Participant 2 is another professional dog walker who works for Jake N Friends Pet Services. He lives in Seattle. He talked a lot about stray dogs and cats and how you have to be careful around them. Whenever he encounters those, he steers the dogs away from them. He sits down with the owner before taking the dog on a walk and would like to let other dog walkers know that there aggressive dogs out there that pose a real danger. He would also want to allow the owner to tailor the walk.

Participant 3

Participant 3 is a graduate of the University of Washington, having graduated in the Computer Science major. He is a part time professional dog walker and own dogs of his own. He thinks it would be useful to learn about the dog's bathroom habits and treat preferences to more easily do his job. Because he lives in Vancouver BC, he is often concerned that the dogs he is walking could get too cold, and he would like a way to monitor the dog's temperature. He would like to have GPS in case the dog gets loose.

Participant 4

Participant 4 is a student at the University of Washington and is a part time dog walker and owns a dog of her own. She lives in Seattle and is really passionate about dogs. She mentions that often times, the dogs will be distracted by numerous things during the walk, often sniffing at stuff on the ground or just standing still seemingly not willing to move. To remedy this, she would tug on the leash, but sometimes that isn't enough and the dog refuses to budge.

Design Research Results and Themes

Health Monitoring

A common theme throughout our interviews was a concern for the dog's health. These professional dog walkers want to make sure that the dogs are getting the exercise they need while at the same time making sure that they are not being overworked. Striking that balance is important for a dog's health, which will make the client/owner (and the dog!) happy. Areas of concern relating to health include temperature (to make sure the dog does not get too cold or too hot), hunger (to make sure the dog has eaten enough to be able to exercise well), age/fitness (to make sure that old or otherwise frail dogs don't overwork themselves), and other areas. This

aspect is something that the owners of the dogs being walked are quite concerned about. The whole point of the walk is to promote the dog's health, so harming the dog goes directly against the purpose. So, it would be good for dog walkers to share health monitoring data gathered on walks with the owners. This implies that we need to include the monitoring of health statistics in our device.

Knowledge of Area

Another common theme throughout our interviews was making sure that the professional dog walkers have knowledge of the area in which they are walking dogs. This includes information like traffic (making sure their dogs are at low risk from getting hit by cars), locations of dog parks (allowing their dogs to socialize), potential triggering environments (which can upset the dogs or make it difficult to control them as they try to chase or attack things), locations of doggie bag dispensers and trash cans (which are useful for cleaning up dog poop), and weather during the time of the walk (to make sure they dress themselves and their dogs appropriately for the inclement weather). Knowledge of the area can often be a problem because of these and other factors. The more a professional dog walker knows about the walking environment, the better the walk will be for both them and the dog. With this, safety, convenience, and the overall effectiveness of the walk are prioritized. This implies that we need to include some information gathering and sharing into our device.

Communication with Owners

A third common theme throughout our interviews was the desire to make sure that there is clear and effective communication about the dogs' welfare between the owner and the dog walker. Participants mentioned potentially having a live camera feed during the dog walks to broadcast to the owners. Like a dash cam, this would allow professional dog walkers to have concrete evidence if something goes wrong. This communication includes notifying owners when the walk begins or ends, where the dog is going during the walk, and the dog's interactions. The more the professional dog walkers know about the dogs' current needs, the better they can look after the dogs on a walk. So, it is important for owners to be very communicative with their dog walkers. This implies that we should maybe add some sort of communication function to our device that can communicate with the owner.

Familiarity with the Dog

A fourth common theme throughout our interviews was the importance professional dog walkers place on being familiar with the dog they are walking. They say that when they are walking with their own dog (or with dogs they know well because they walk them regularly), they know the dog's behaviors, preferences, and problem areas and could adjust the walk to account for those areas. However, with a dog they don't know, they don't know the dog's behaviors, preferences, and problem areas and thus must sometimes learn about these the hard way. This can be inconvenient, or even dangerous, depending on the situation. This implies that we need to include some sort of functionality that allows the dog walker to keep track of these behaviors and preferences for each dog in the device.

Answers to Task Analysis Questions

Who is going to use the design?

The design will mainly be used by professional dog walkers, though casual dog walkers could benefit from our designs as well. Owners will also benefit from this design, when they have

time to walk their own dogs. And, of course, the dogs themselves will benefit from the reduction of unpleasant experiences during the walk.

What tasks do they now perform?

On a walk, professional dog walkers take dogs they do not own, potentially in an unfamiliar area, interacting with a variable environment, then return the dog safely home. During this, they have to monitor the dog's welfare and behavior and manage the dog when it gets rowdy.

What tasks are desired?

The tasks that are desired are the ability to notice potential triggers, the ability to determine the best route for the walk, the ability to keep track of the dog's health, and the ability to communicate with the dog's owners.

How are the tasks learned?

The tasks are learned mainly through experience. Professional dog walkers gain experience walking dogs multiple times. They get a better instinct for what makes a good walk and how to execute that good walk. There aren't really "professional dog walking classes" that many people use.

Where are the tasks performed?

The tasks are performed in many locations, all of them outside. Sometimes they are performed in the neighborhoods where the dogs live. Sometimes, they are in areas where the dog walker wants to take the dog, even if it isn't the dog's neighborhood. Either way, dog walks are often done on sidewalks, near roads, parks, buildings, houses, yards, etc.

What is the relationship between the person and data?

There is data that the professional dog walkers would want during a walk because it would be useful, like weather patterns, neighborhood triggers, trash can locations, the dog's health, the dog's favorite treat/motivator, and other metrics.

What other tools does the person have?

Currently, professional dog walkers use a combination of tools, including phone apps, harnesses for dog training, treats, memorization, websites like Weather.com, Google Maps, and other tools.

How do people communicate with each other?

If the communication is with a person not on the walk, professional dog walkers often use their phone to communicate, especially if it is to communicate with the owner. If it is a person they meet on the walk, then they just talk in person.

How often are the tasks performed?

Most dogs must be walked at least once a day, every day. Often times, since the dog walkers walk multiple dogs for different clients, they have to do dog walks multiple times a day in different neighborhoods with different clients' dogs.

What are the time constraints on the tasks?

The time constraints professional dog walkers have on the tasks includes the fact that the dog will eventually get tired from the exercise. Also, the owner will eventually want their dog back

and the professional dog walker often has to account for having to walk multiple dogs several times in a day.

What happens when things go wrong?

Professional dog walkers have insurance for catastrophes. The dog can get hurt, the dog walker can get hurt, or a bystander can get hurt because the environment might have dangers like cars, aggressive dogs, and other things. More mildly, the owner may just not like how the dog walker handles things and take their business elsewhere.

Proposed Design Sketches – "3x4"

WalkMate

This device supports four tasks: stores the behavior and personality of the dog, alerts the dog walker of injuries, allows the dog walker to input information about the dog into the device, and report health statistics. The device includes an attachment that clips on the dog's collar to retrieve information about the dog's health and possible injuries, and it can store the information about the dog's behavior from the client. The clip measures statistics of the dog's health and that information can be accessed through a compatible scanner. It comes with a scanner that can

retrieve this information from the clip and display this in a readable format. The clip can also double as a GPS tracker that allows the owner to see a map of the area from the scanner and also locate the nearest dog poop dispensers should the dog walker needed. Users can find and mark points of interest on this device.
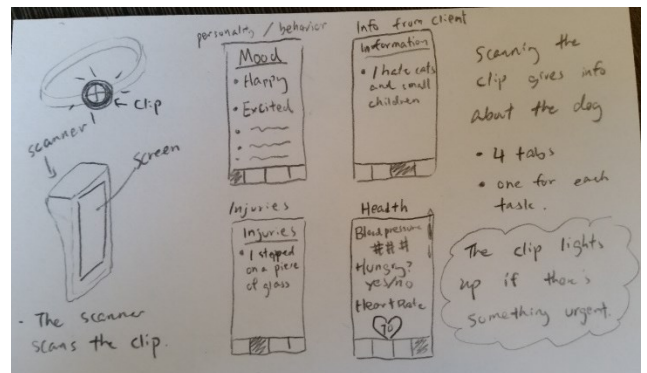
Smart Harness

A device that is a harness that has the capability of GPS tracking that allows the screen on the harness to show points of interest, both good and bad, the good including dog poop dispenser locations, and the bad including houses with items that could trigger the dog like other barking dogs. It also has an attachable blood pressure cuff to track the dog's health statistics and display them during the walk. It also features an ability to track the dog's behavior during the walk as it offers an input functionality to input notes and other relevant information about the dog to the device.
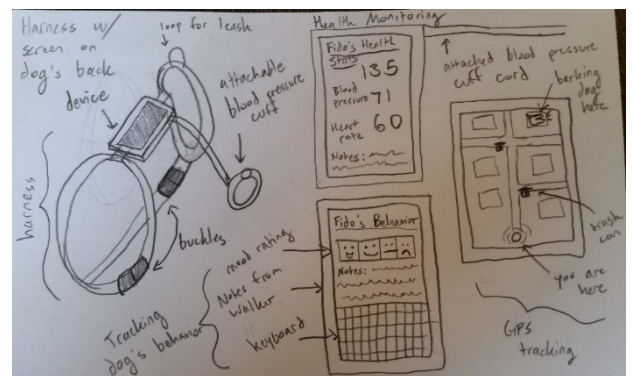
Simple Leash

A device that is like a leash that has GPS tracking capability that allows the screen attached to the leash to display a map of the area allowing the walker to plan a good path and points of interest like dog poop bags dispensers. It has a button on the leash to immediately call the owner in case the dog walker needs to do so, allowing quick contact with the dog's owner. The device also has note taking functionality to take information about the dog's behavior and tendencies, as well as to keep track of information about the dog.
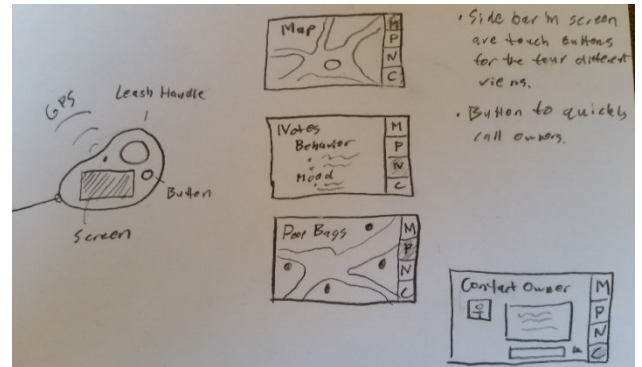
Design Choice

We have decided on using the clip-on attachable as our design for our project. With this design, we aim to focus on two tasks for our design refinement. One of the two tasks is to keep track of the health of the dog and its health statistics to make sure it is okay and isn't overworked. The other task is to use location finding to find and mark points of interests and points of not-interests and improve pathfinding. We choose this design for reasons including the fact that this design is the most unobtrusive for the dog and the walker of the three designs we came up with. There is also the fact that the design offers the most flexibility when it comes to the design of the scanner, which could be a phone attachment, and individual device, or a program on the phone. We chose to focus on the task of monitoring health because that was the issue that came up prevalently and consistently throughout all our interviews. We also chose to focus on the location finding functionality due to the fact that a lot of issues that our interviewees had when walking the dog could be solved by location finding or some map utility, like finding the nearest dog poop dispenser, finding dog parks to socialize, or avoiding areas that are unfavorable. It is these two tasks that came up the most during our user research.

Written Scenarios – "1x2"

First Scenario

Bartholomew is a college student and a part-time dog walker who is a little forgetful and not mindful of his surroundings due to having classes on his mind. For example, today he left his dog poop bags at home, so it was a problem for him when the dog decided to do his business during the walk. Thankfully, Bartholomew's friend, who is a more experience dog walker, convinced him to get the WalkMate a few days ago. WalkMate is a device that supports multiple functions, including GPS tracking and finding and marking points of interest. Shown in panel 3 of the storyboard, Bartholomew only needed to type in "Closest dog poop bag dispenser" at the top of the screen to find all the dog poop bag dispensers in the area, and WalkMate was able to display all the information on a map, including the shortest path to the location of interest, so it was easy for Bartholomew to find the thing he wanted.
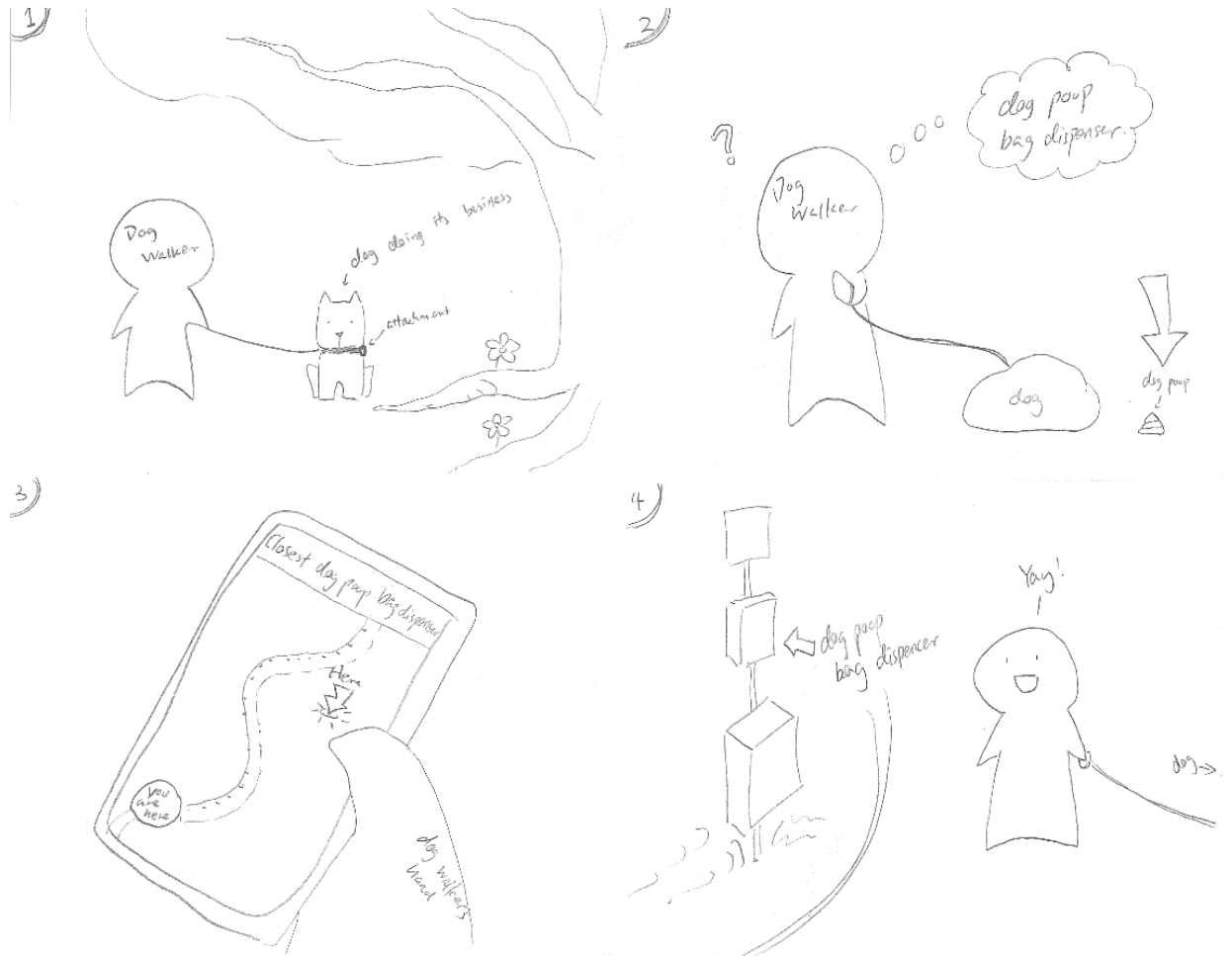
Second Scenario

Robert is a newly minted dog walker who is contracted to walk a dog by its owner. Being new and a little bit inexperience, Robert wants to make sure that the dog is okay during the walk. He does not have a feel for what is a good walking amount for the dog and whether or not the dog is getting tired or overworked. Thankfully, Robert happens to have the WalkMate, a device that he

clipped onto the dog's collar before embarking on this walk. Now, he can walk without fear of overworking the dog. While he is walking, the WalkMate keeps track of the dog's health statistics, that can be viewed at any point in time. It also can alert Robert, as shown in panel 2 and 3 of the associated storyboard, about when it thinks that the dog is getting overworked, signifying him to start wrapping up the walk and walk at a slower pace. Thus, Robert can make the walking experience better, less stressful, and safer for both the dog and himself. Robert can now be assured when the dog is in okay condition during the walk.
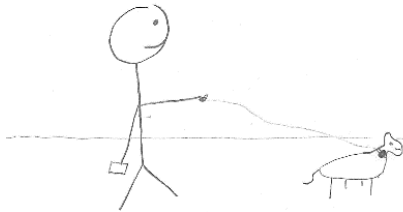
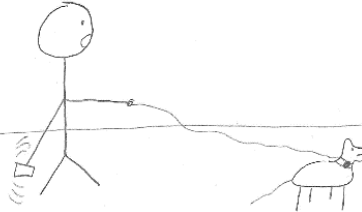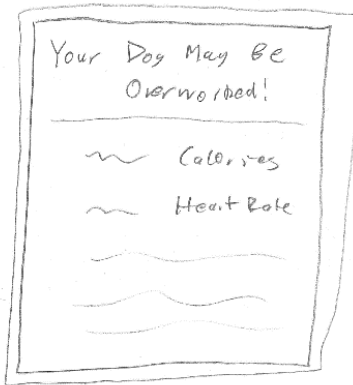# Storyboards of the Selected Design
First Scenario

Second Scenario

Jim is walking the dog.

He gets an alert on his device

The device relays health statistics from the clip

Your Dog May Be Overworked!

~ Calories
~ Heart Rate

With the information, he walks slower.

Slow & Steady