Kibble

Team and Roles

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Problem and Solution Overview

Raising pets brings happiness to families and teach youth responsibility in an engaging meaningful way. However, keeping pets fed and healthy is not always an easy task. When multiple people share the responsibility of feeding the same pets, a problem emerges: family members cannot track when a pet needs food unless they schedule feeding, or effectively communicate. Second, finding a lost pet always causes a lot of trouble to pet owners. Creating and distributing lost pet posters to find a lost pet is not only cumbersome, it is not effective. We believe that a mobile app along with a location sensing tag can help people with these issues. The tag which is attached to the pet's collar, would have a built-in GPS sensor and a button to record feeding activity. This app, Kibble, would track pet's location to find their pet, and allow pet owners to make sure their pet is getting the correct diet.

Contextual Inquiry Target, Stakeholders, and Participants

We did three contextual inquiries for a better understanding of our potential users, people who live with family and own pets. We scheduled appointments with families, interviewed them and observed their behaviors while interacting with their pet.

Tim's family: Tim's family only owned a dog for 1 year and 5 months now. Since it is their first pet, they are not very knowledgeable about pets. Their pet is walked at least once daily, by any available family member. Tim's father fills the the feeder when he sees that it is empty, which is an incorrect feeding practice. His family doesn't remember when the last vaccine was and what it was for. The contextual inquiry took place at their home. Tim's

family dog has been sick a couple of times, but the family has not ever felt the need to take it to the vet because the symptoms were not serious. Their dog recovered, without medication, after a few days. Tim said their dog could jump their fence and used to run away often. They would search by walking around calling for him and found him around the neighborhood in various neighbors' yards. During our follow up inquiry we talked to Tim about issues training his pet commands and tricks. We identified a task associated with the training regime we observed but this task is not included in our final design.

Parker's family: This family has owned their dog for 9 years, since Parker was 12. He left home for college 3 years ago but he helps take care of the dog when his family is out of town and when he is home during vacation. He said the dog goes for walks almost every day with his mother, and spends most of the day at home sleeping. The contextual inquiry took place at his home, where we interacted with the dog, and watched it interact with Parker, his sister, and his mother.

Carolyn's family: She and her husband have owned one dog for 10 years. They share the responsibility of feeding the dog every morning and night depending on their work schedules. Carolyn walks her dog 5-7 times a week. Her husband plays with the dog by throwing a tennis ball several times a week. The inquiry took place at her home, where we saw her interacting with and feeding her dog dinner. This dog recently had a seizure and the incident scared Carolyn because she did not know how to react. It was late at night so the vet was unavailable and she resorted to searching the internet for advice on what to do.

Contextual Inquiry Results and Themes

All of our participants want their pets to have a happy healthy life but some of them do not have much pet care knowledge such as Tim's father's incorrect feeding behavior. All families felt unprepared to handle medical emergencies, and felt unsure about when a trip to the vet is necessary. According to the contextual inquiries we performed, we have summarized four major themes:

First, we have identified the issues occurring in feeding pets. We have found that none of our participants had specific feeding tasks assigned to every family members. We observed instances of incorrect feeding habits like feeding a dog whenever the dog bowl was found empty, as opposed to a traditional dog feeding schedule of twice a day which was labeled on their dog food. In the third interview, responsibility for feeding was shared between a husband and wife. They told us that a few times a month they accidentally fed their dog twice for the same meal or skipped a meal. Two of the families specifically stated that it's hard to coordinate between family members when there is nothing to keep track of their feeding record and notify the other family members whether the pet has been fed or not.

Second, we have found most of our interviewees didn't have a convenient way to check the vaccine due dates for their pets. One family showed us a reminder postcard from their vet to come get a vaccine. One other family has only gotten vaccines for their pet when at the vet for another reason or when necessary to board their dog while going on vacation. Unfortunately, none of them knew if there pet's had all of the necessary vaccinations currently up to date. There was nothing to keep track nor to remind them, thus making it very easy to forget.

Third, we have learned that some of interviewees lacked basic pet care knowledge. They didn't know when to groom their pet, bathe their pets or trim their nails. They do these things sporadically when they think that it is the right time. According to Parker's experience: they didn't trim their dog's nail for long time, and his dog tried to trim itself by scratching the wall, which hurt the wall and the dog's nail.

Lastly, we have identified a task associated with the training regime we observed. Pet owners often write down their pet tricks progresses on a notebook and train their pets according to the progress. They also write down the trick to learn.

We have gained lots of useful information from these contextual inquiries, we have identified daily problems occurring with pet owners in terms of family coordination, vaccine dates checking and basic pet care knowledge. Therefore, we have found a necessity to

alleviate these problems by designing an application to solve these issues. Because there is such a wide range of pet related issues, such as different illnesses and injuries, tracking feeding and vaccines, a software solution that handles everything in one place would be helpful for pet owners.

Answers to Task Analysis Questions

1. Who is going to use the design?

Pet owners whose family share pet raising tasks and need a better way to communicate effectively about when to feed pets. Pet owners that want to track their pet's diet. The last group of users are pet owners who have want to be able to easily find their pet when it gets lost.

2. What tasks do they now perform?

Family members fill the pet food bowls when they think their pet needs to be fed but lack communication and coordination so they often do not notify the other members. Owners that are filling the bowl when it is empty lets the dog choose how much it eats which does not allow a consistent healthy diet For vaccines, vets usually send cards to pets owners to remind them if they need a vaccine, so these owners keep track of the due dates with these cards. All of our interviewees value their pets' exercise and take their pets out for exercise weekly which is good and uncommon for pet owners. When pets are missing they scan neighborhood on foot, calling for pet.

3. What tasks are desired?

- Notification for pet feeding time/quantity and synchronization between pet owners
- Reminder/Notification for pet vaccine dues (especially useful when owners have multiple pets)
- Instructions for pet first-aid and exercise
- Pet exercise and health tracker
- Pet training: behavior, commands and tricks
- Find lost pets

4. How are the tasks learned?

Tasks will be learned in an intuitive fashion: every functionality in our design will be task-driven and accessible to users. For example, if users want to set up notifications for pet feeding, they can click the icon and set up time with basic workflow. To make these task even easier to learn, we might create a tutorial page for them.

5. Where are the tasks performed?

Tasks are performed wherever and whenever regular feeding should occur and when vaccines are due through notification systems. Tasks associated with finding lost pets will only occur when pet is missing and their location is based on the whereabouts of the pet and owner..

6. What is the relationship between the person and data?

The notification data are entered and set by a user for future reminders
Vaccine schedule can be either entered by a user or pre-loaded by our application.
Pet care guidance including first-aid instructions are taken from various web resources for user's reference.

7. What other tools does the person have?

One family occasionally uses text to communicate if they fed the pet. Pet owners could use a paper or calendar with some kind of markings to say they have fed the pet to coordinate with their family; vaccine cards to remind of vaccine dues; handbooks for pet care; smartphone camera apps to record their pet growth.

8. How do people communicate with each other?

Family members will communicate about when and how much they feed their pets through our application with other members. Other than that, they can set up notifications which will be sent to other family members. They can also communicate with other nearby users of the app when their pet is lost to help locate the pet.

9. How often are the tasks performed?

The tasks are performed whenever users feed their pets, want to check vaccines schedule, or get access to pet care instructions. Optimally a user with one pet would use the software no more than a few times a day.

10. What are the time constraints on the tasks?

Feeding recording task is prefered to be performed right after users feed their pet in case users forget about feeding activity. The rest tasks can be completed at user's will.

11. What happens when things go wrong?

There are some potential errors during the usage of our design. For feeding, family owners might forget to record their feeding activity, and other members may think their pet hasn't been fed in consequence. There might be software failure that notifications cannot be pushed to users. When things go wrong users must revert to their previous method of communicating in person via text or speech to coordinate pet feeding.

Proposed Design Sketches

Design 1

Our first design is a wearable dog tag with built-in GPS, heart rate and gyroscope sensors. Besides the sensors, the tag has two buttons: one is colored green and when people feed the pet, they can click this button to

record the feeding time; the other one is a red button for emergencies, that when pushed can call the vet and allow you to talk through the integrated speaker and microphone about your situation. The tag has 1.5-inch LED display which shows if the pet has been fed and the heart rate of the pet. The tag exchanges info with a web interface to track feeding and health stats as well as aiding in geolocation of the pet.
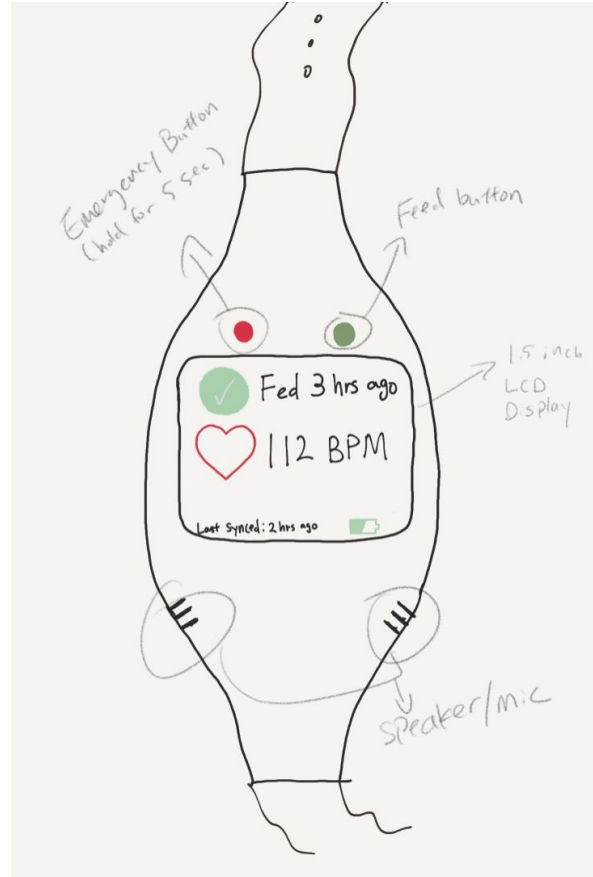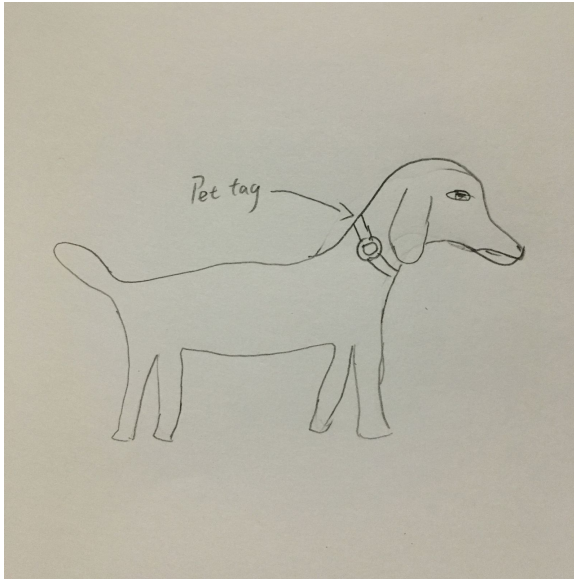
Task 1: Finding Pet

The tag has a GPS sensor which can tell us where the pet is when pet owners cannot find the pet. The other two designs or a web interface can be used to find the pet on a map. So, people who want to find a pet can just open up a browser to check where the pet is. The owner can control the speaker for help them find the dog.
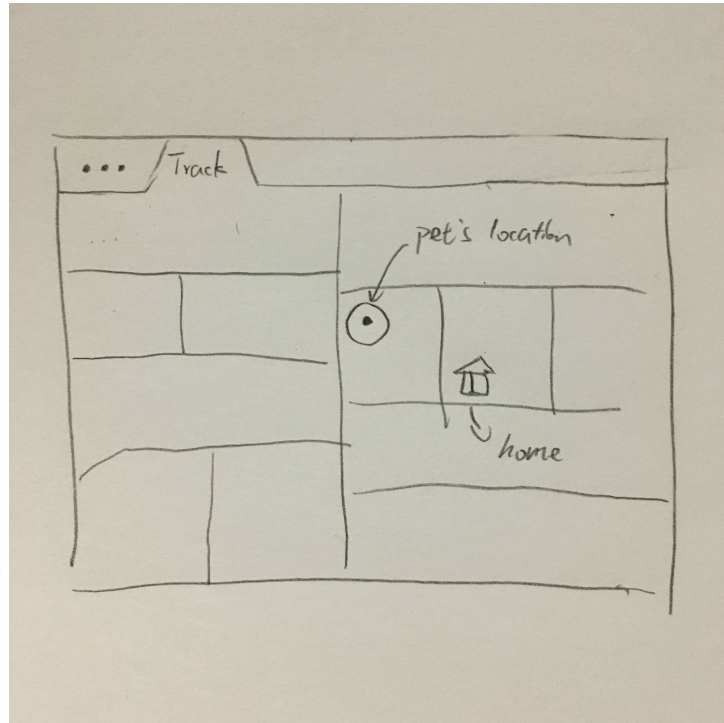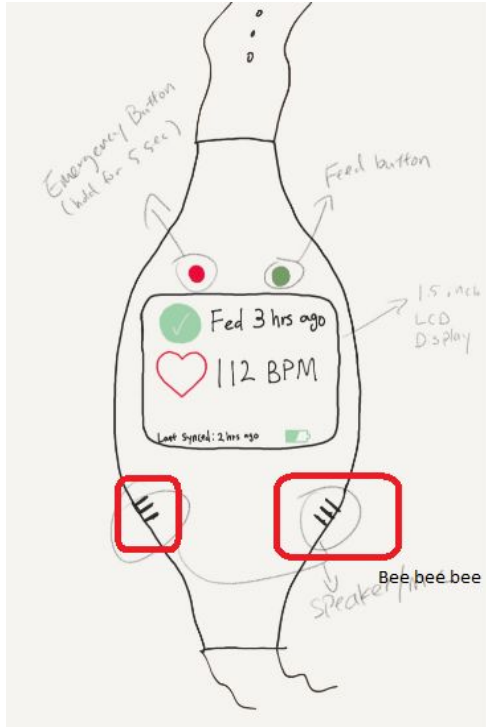
Task 2: Tracking Pet Statuses

With the built-in sensors, the tag will track various functions including heart rate of pet, walking distance and routes of pet, and sleep. Users can get access to these data through our web interfaces.
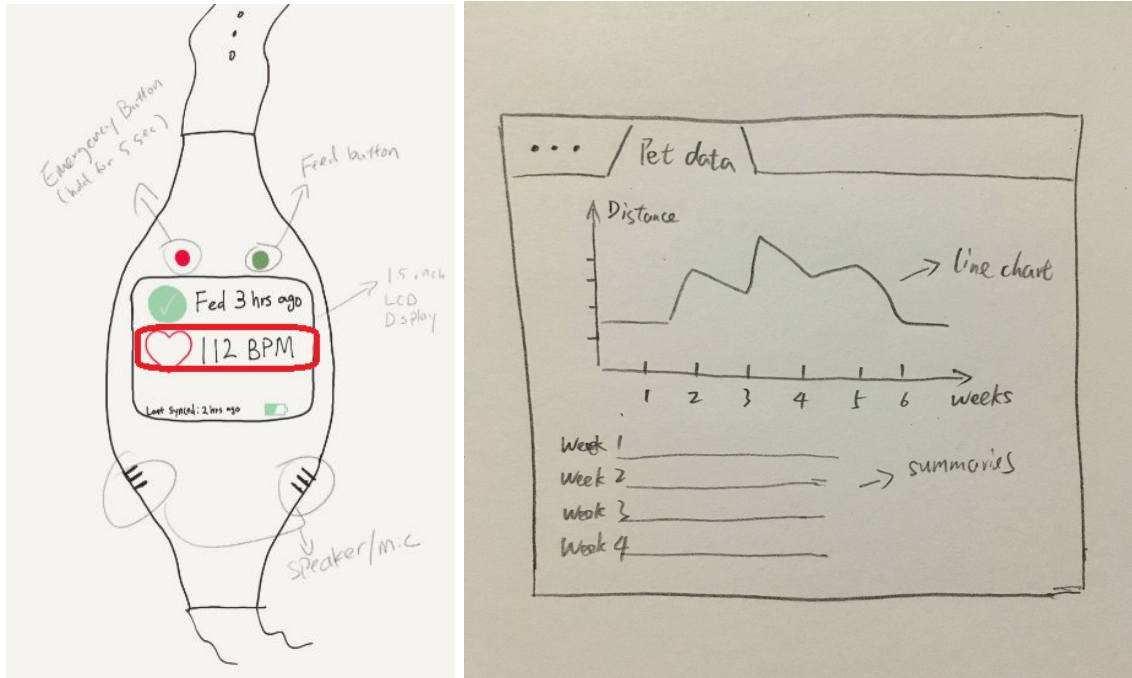
Task 3: Synchronizing Feeding of Pet Between Family Members

      People can push the green button on the tag which is set for people to record the feeding time, while users can check the display which tells pets owners if the pet has been fed on time. If the light is green, which means pet doesn't need to feed now. However, when the light turns red, owner should feed their pet as soon as possible.
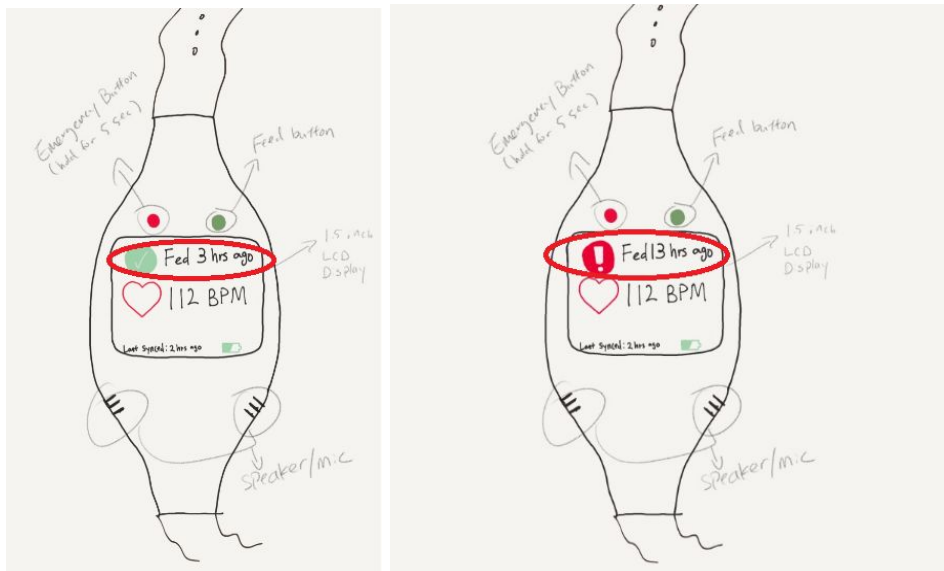
Task 4: Responding to a Pet's Medical Emergency

If the pet has medical emergency, people can push the red button on the tag. It will call the vet and allow users to talk through the integrated speaker about the pet's situation.
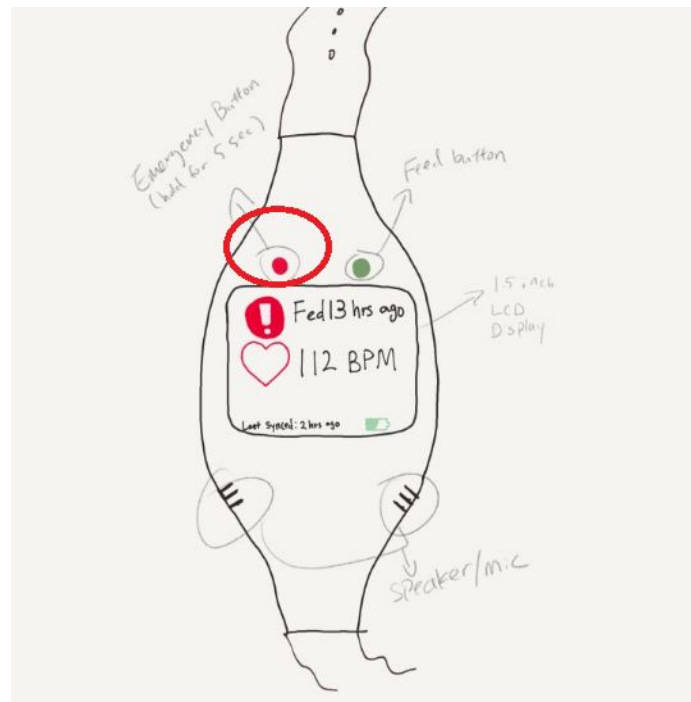
Design 2

Our second design is an electronic device with a touch screen that can be mounted on wall and close to the pet's feeding station. A GPS tracker tag is needed for our design which only tracks pet location. This device will be a hub for pet related activities including synchronizing feeding, tracking pet statutes, recording training sessions for tricks, and finding a pet.
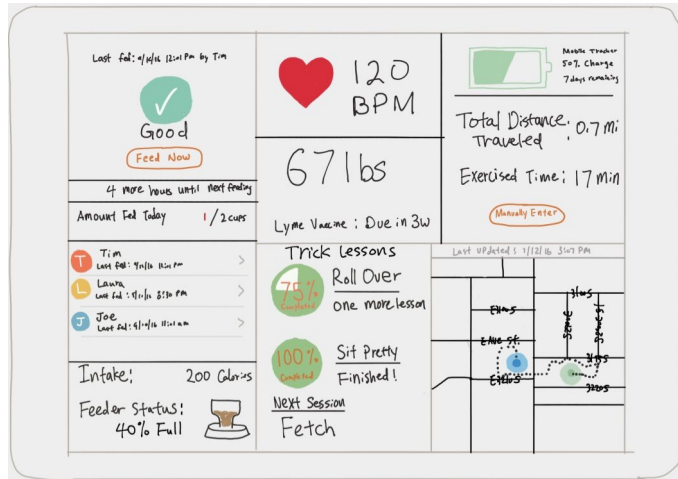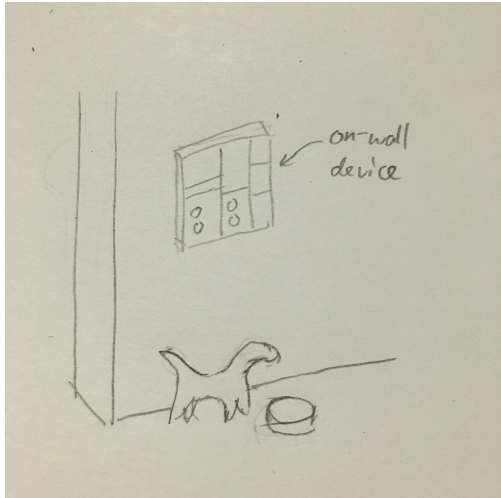
Task 1: Synchronizing feeding

The on-wall device has in-screen button for people to record the feeding time. The rest area of the screen can tell pets owners if the pet needs to be fed or how many hours until the next feeding. Users can enter the food amount on the left inbox and click the button to confirm.
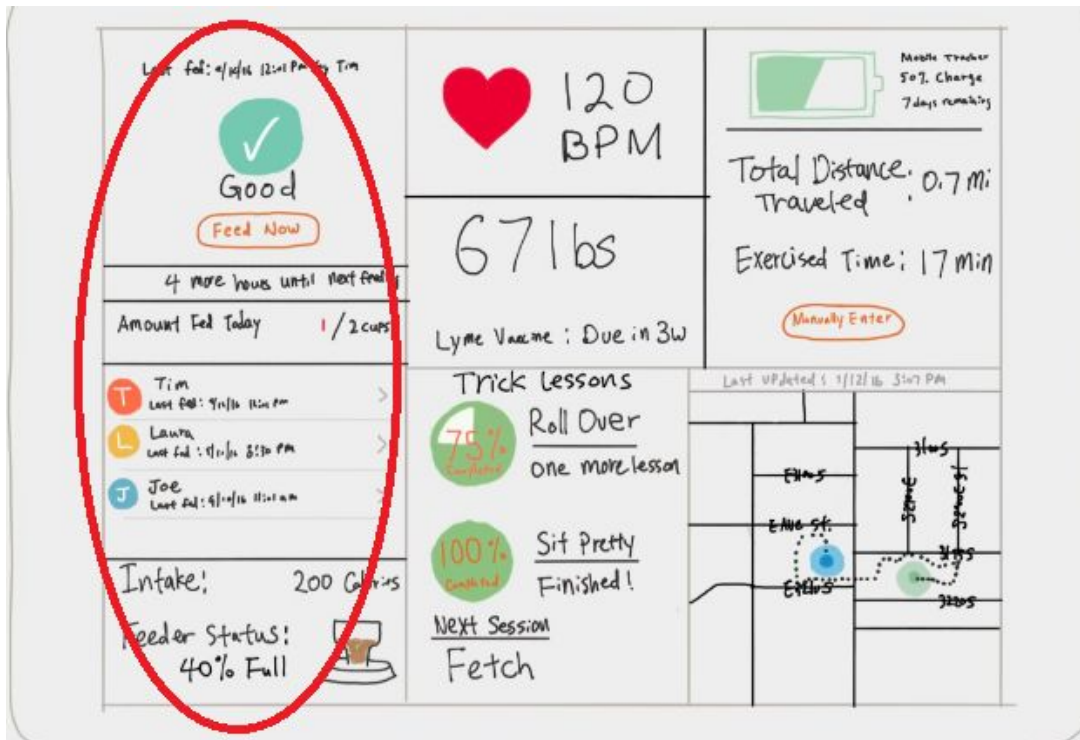
Task 2: Tracking Pet Statuses

The device provides an interface for entering the statuses of the pet, such as weight and impending expired vaccinations. Also, the device can show walking distance and routes of pet. Similar with the last task, users can enter the data and schedule into this device.
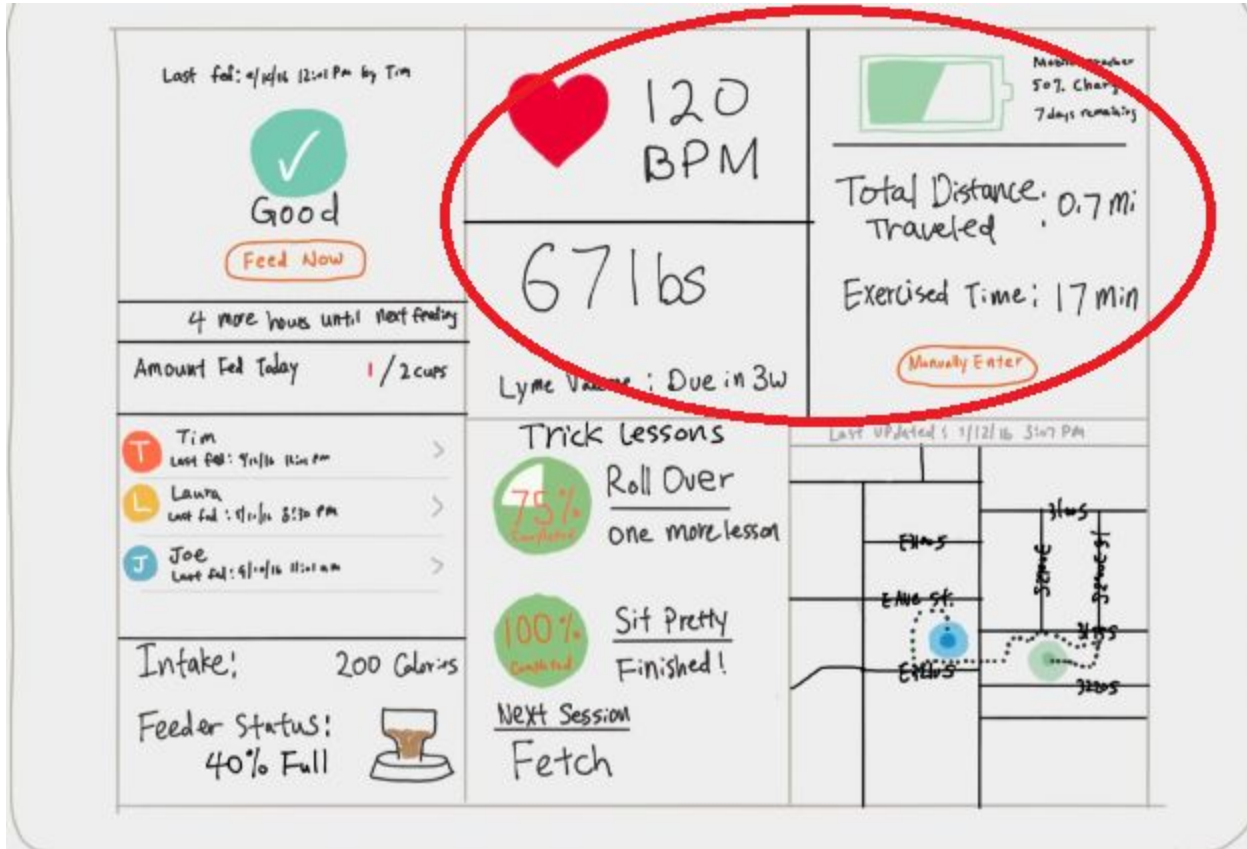
Task 3: Track progress and training session on pet tricks

People can track their progress on training pets with tricks, they can record finished and upcoming training session on this device.
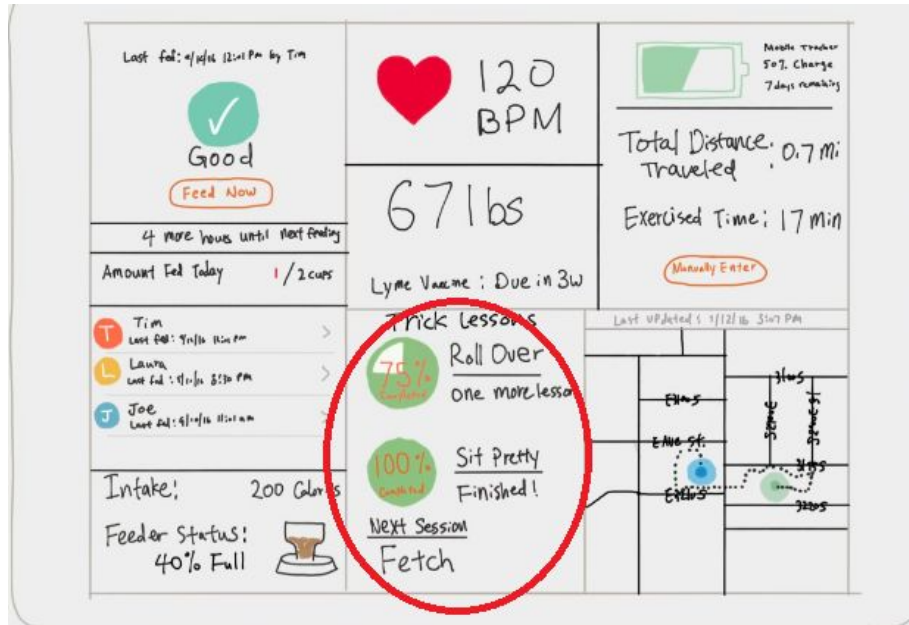
Task 4: Finding Pet

With the GPS tracker tagged on pet, the device can show the current location of the pet. By clicking "Find my pet" button, users can check where the pet is.
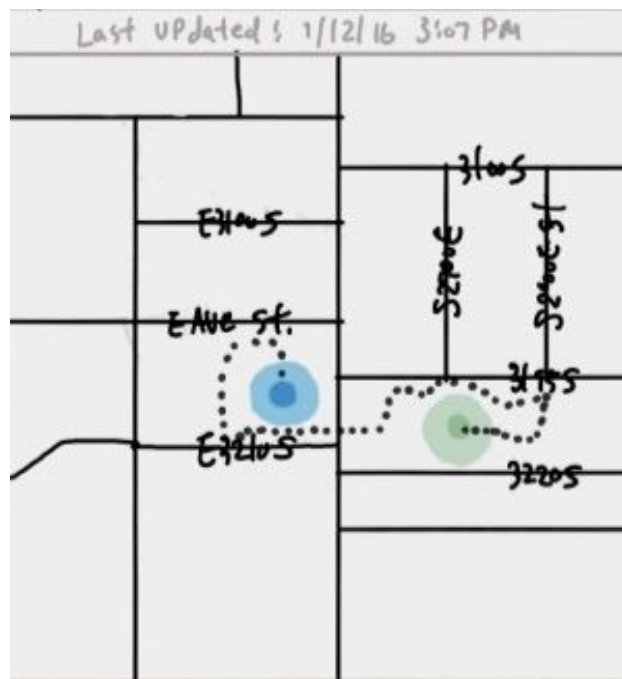
Design 3

Our last design is a mobile app which can help pet owner find their pet, synchronize feeding and helps them learn about general pet care education and how to react to pet medical emergency.

Task 1: Synchronizing Feeding of Pet Between Family Members

In the main menu of the app will be info about the pets feedings. If the pet needs to be fed and if not when it will be. It will have history to track who fed the pet and when.
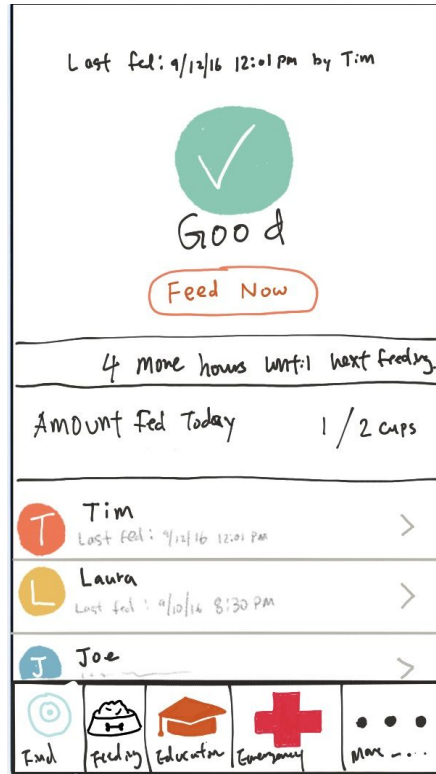

Task 2: General Pet Care Education

Our app contains general pet care education videos and articles, which can let pet owners learn basic knowledge of their pet such as how often they should feed it, what kinds of food they should buy, what foods are toxic to your pet, and how to bathe their pet. Users will choose what kind of pet they owned and the app will present them appropriate articles and videos.

Task 3: Responding to a Pet's Medical Emergency

For this function, the app with list some nearby pet hospitals, allow user to call a vet, and give some instruction to teach pet's owner how to deal with some common emergency. The user can type the keyword to search for the emergency that they have.
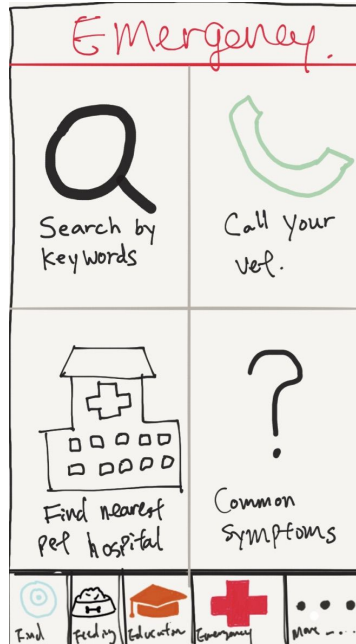
Task 4: Finding Pet

Pet's owner can use our app to find their pet via GPS. In this function, we have a real time map, the blue dot indicate owner's location and green dot for the dog. The owner can report their pet lost in this interface, which will alert other nearby pet owners who are also using this app.
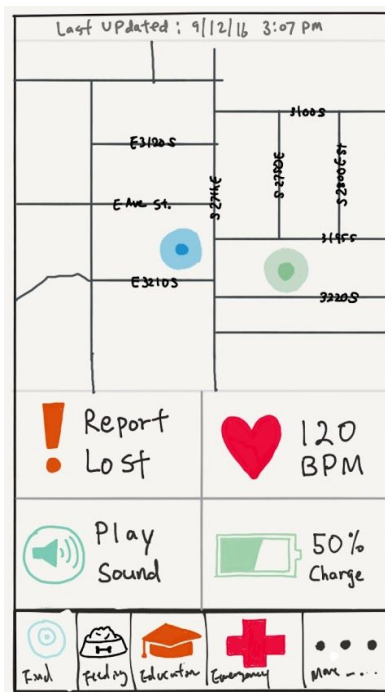
Choice of Design and Tasks

Our team decided to choose the tasks of synchronizing feeding of a pet between family members and finding the pet when lost. We chose these two tasks because of all the positive feedback we've received from contextual inquiries.

For the final design of our project, we have decided to focus on the mobile app in combination with a GPS tag to help users to locate their lost pet. Not only can it locate where the dog is, the GPS tag features one button for extended functionality. There's a green button that's used to keep track of feeding history of the dog. When the dog is fed, simply press the green button and it will synchronize the feeding history with paired smartphones. The tag will show the current status of the pet's feeding on its screen, either needs to be fed now, or does not need to be fed.

This design best suits our target users, pet owners in a family, because synchronizing feeding of the pet between family members through text messages and locating lost pets usually cause inconvenience in a pet owner's daily life, now they can simply utilize the collar tag and app to get rid of the trouble. What makes these two tasks compelling is that people no longer need to send text messages to coordinate feeding among family members and pet owners will feel much more relieved when their pet is missing because their pet can be easily tracked.
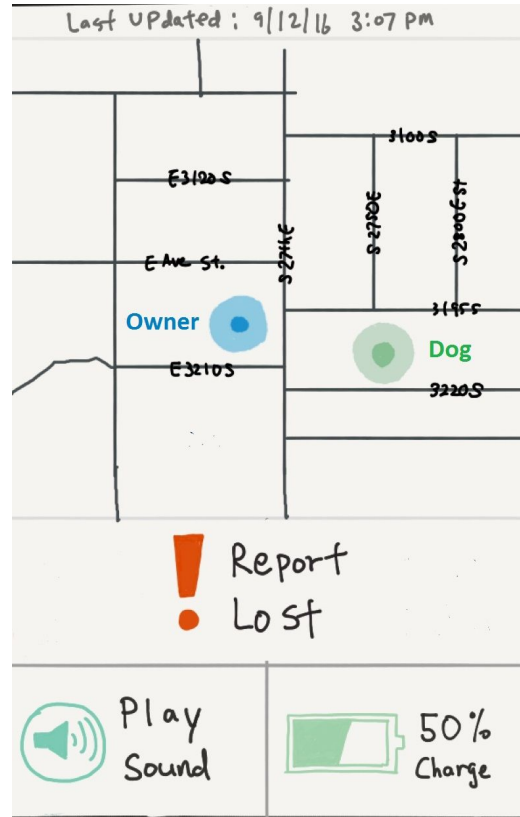
Sensor Tag   Mobile App

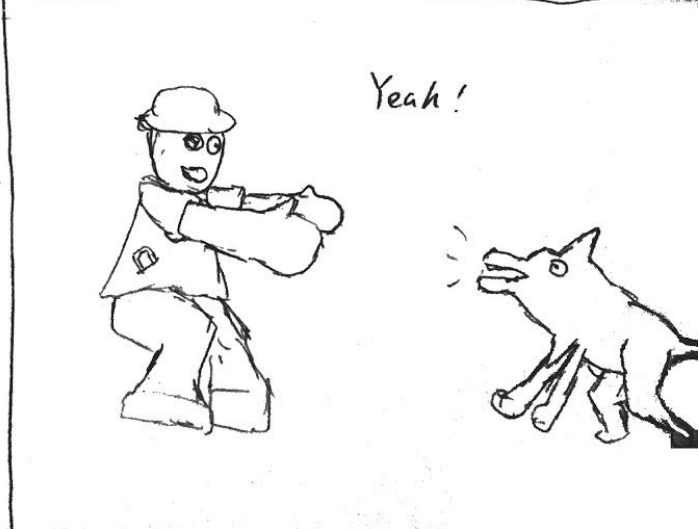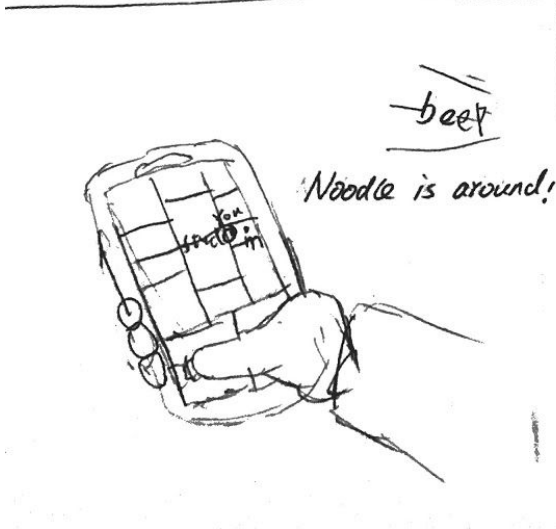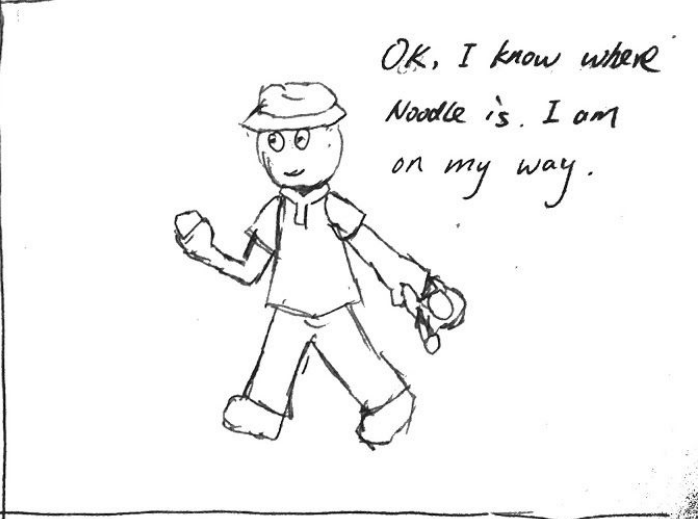## Written Scenarios

Scenario 1:

      Jack owns a dog named Noodle and keeps it in his backyard. One day, he was going to walk Noodle but he didn't see Noodle in its room. He kept calling Noodle's name for a few times but got no response. He just realized he got a smart tag for Noodle and he picked up his phone and checked Noodle's location. From the app, it showed Noodle was outside of the house right now. Jack went out with his phone to look for Noodle. After a few minutes walk, the map showed the Noodle was nearby but Jack could see Noodle yet. Jack used the "Sound" feature, which tells the smart tag to produce a sound. Finally, Jack finds Noodle with the help of the sound.

Scenario 2:

Tim usually gets up and feeds his dog Doodle at 8 a.m. However, sometimes he forgets to feed Noodle in the early morning. In this case, Tim's daughter Alice will feed Doodle. To coordinate feeding, Tim pushed the green button on Doodle smart tag after he fed the dog and left home. After one hour, Alice was going to check if Doodle had been fed. She noticed that the smart tag on Noodle was showing "Fed" on the display.

Storyboards of Selected Design

Scenario 1:

Scenario 2: