Jackie Owdij Woodson

HCI 598 Capstone

M3: The Design

**Summary**

Have you ever wondered how many hours does my cat sleep; how many times does my cat use the litter box; how many times does my cat eat and drink; how many hours is my cat active; are my cat’s behaviors healthy? Cat Watch gives you all this information and so much more!

There will be two components to the Cat Watch system. One component will be a lightweight tracker that your cat wears on his or her collar. The other component will be a web application that allows you to upload a diagram of your house and indicate where specific hot spots are in your house, such as feeding bowls, water dishes, litter boxes, etc. The tracker on your cat will send data about your cat’s behaviors to the web application. Your Cat Watch web application will display the data in an intuitive and user-friendly manner.

The Cat Watch web application will be interactive. Users can view current metrics and click an animated video of the cat’s path throughout the house. Cat Watch lets you compare your cat’s current behavior to your cat’s past behavior and to other cat’s behaviors. As a Cat Watch user, you can talk to other cat owners to see if your cat’s behaviors are healthy and normal. Some information Cat Watch will allow its users to see are how many times does my cat eat, how many times does my cat drink, how active is my cat, how many times does my cat sleep, how many times does my cat go to the bathroom, etc.

The overall stakeholders of Cat Watch will be people who have at least one pet cat. According to the American Pet Products Association 2011-2012 National Pet Owners Survey, the number of cat owners in the United States is a decent size population with 86.4 million cats owned and about one of third of households owning at least one cat (U.S. Pet, 2012). Some examples of different Cat Watch users are cat owners who are away on vacation, cat owners with a sick pet, cat owners having trouble with their cats, cat owners who are curious about their cat’s behavior, etc.

There are several non-user groups that could be impacted by Cat Watch. One group of non-users who will be impacted by Cat Watch will be the cat owners’ pet cats. They will be wearing lightweight trackers that will send information about the cat’s behaviors to the Cat Watch web application. Another group of non-users who could be impacted by Cat Watch would be pet stores. Cat owners might start buying more or less of certain products (toys, sleeping areas, food, litter, etc.) based on what they learn about their cat from Cat Watch. A third group of non-users who could be impacted by Cat Watch would be family members or friends who are not the primary cat caretakers. As cat owners use Cat Watch and understand more about their cat’s behaviors, they may ask family members or friends who are not the primary cat caretakers to help care for the cat (play with the cat for exercise, give the cat more food/ water clean the litter, etc.) when they are not home.

Cat Watch will focus on users who are away on vacation. These users will be away from their homes and not see their pets each day. They want to make sure their pets are exhibiting healthy and normal behavior while they are not home. These users will be interested in behaviors, such as is their cat eating, is their cat drinking, is their cat sleeping, is their cat getting exercise, etc.

The background and skills of Cat Watch users will vary. There will be a range of users with different expertise in taking care of cats. Some users will be experienced cat owners with multiple cats and can quickly identify abnormal cat behavior. Other users will be new cat owners, will not be familiar with cat behaviors and will need help identifying abnormal cat behavior. There will be a range of users with different technical skills. Some users will be very technical and have advanced skills using mechanics, computers, websites and social media. Other users will be non-technical and have little to no skills using anything mechanical, computers, the Internet and social media.

Some tasks users will want to complete with Cat Watch are:

* Get a view of the number of times your cat ate, the number of times your cat drank, the number of times your cat used the litter box, the number of hours your cat slept and the number of hours your cat was active.
* Click a video (animated diagram of cat’s movements) and watch the path your cat traveled throughout your house.
* Analyze the number of times your cat eats, drinks and uses the litter box compared to the number of times your cat ate, drank and used the litter box in the past.
* Compare the number of hours your cat sleeps and the number of hours your cat is active to national averages.
* Post a question about your cat’s behaviors.

Cat Watch users will use their desktops, laptops or tablets to access the Cat Watch web application. Users might use desktops located in their house, at work, in a common area at a hotel, at a family member or friend’s house or anywhere a computer desktop might be located. Users might use laptops or tablets located in their house, in hotel rooms, at work, at a family member or friend’s house, while on the move or anywhere a laptop or tablet might be used. The lightweight tracker users will put on their pet cat will most likely be done in their home or at the cat’s vet. In the future, Cat Watch has plans to expand to into the mobile arena and create a mobile app. Cat Watch’s first release will be as a web application.

**Requirements**

Cat Watch’s list of formal requirements is listed below. The user must be able to:

1. Safely attach the lightweight tracker to his or her cat’s collar.
2. Sign up for a free, 30-day trial of the Cat Watch application.
3. Create an account for the online Cat Watch application.
4. Login into the online Cat Watch application.
5. Select the pet he or she wishes to view, if he or she has multiple cats registered with Cat Watch.
6. View the number of times his or her cat ate.
7. View the number of times his or her cat drank.
8. View the number of times his or her cat used the litter box.
9. View the number of hours his or her cat slept.
10. View the number of hours his or her cat was active.
11. Select the day he or she wishes to view his or her cat’s metrics.
12. Click a video, which is an animated diagram his or her cat’s movements, and watch the path his or her cat traveled throughout his or her house.
13. Stop the video, pause the video, rewind the video and fast-forward the video.
14. Select the day he or she wishes to view the video about his or her cat’s movements.
15. Compare the number of times his or her cat eats to the number of times his or her cat ate in the past.
16. Compare the number of times his or her cat drinks to the number of times his or her cat drank in the past.
17. Compare the number of times his or her cat used the litter box to the number of times his or her cat used the litter box in the past.
18. Select the day from which he or she wishes to compare his or her cat’s past metrics.
19. Compare the number of hours his or her cat sleeps to the national average for how many hours cats sleeps.
20. Compare the number of hours his or her cat is active to the national average for how many hours cats are active.
21. Select the day he or she wishes to compare his or her cat’s metrics to national averages.
22. Post a question about his or her cat’s behaviors.
23. View and respond to other user’s questions about their cat’s behaviors.
24. Configure the Cat Watch application with his or her personal settings.
25. Contact the Cat Watch team with questions, comments or suggestions.
26. View an online help showing how to use Cat Watch.
27. View an online Cat Watch application that is user friendly.

**Design Space**

The Cat Watch system has several design tradeoffs. Two of the primary tradeoffs in the Cat Watch system are "access to all information vs. simplicity and clarity" and "long battery life vs. mobility". The "access to all information vs. simplicity and clarity" design tradeoff affects the Cat Watch online application. Access to all information and simplicity/ clarity are two important aspects of the Cat Watch online application. The cat’s tracker will be sending a lot of information every minute of every day about the cat’s behaviors to the Cat Watch application. The Cat Watch application will need to be designed in a way to display this information, so the application is not overloading users with information. The Cat Watch web application needs to be simple and clear for its users. Cat Watch users will have all different types of technical backgrounds. If the application is not simple and easy to use, non-technical users will have a difficult time using the application and might decide not to use the application.

The "long battery life vs. mobility" design tradeoff affects the lightweight tracker the cat wears on his or her collar. Long battery life and mobility are two important aspects of the cat’s lightweight tracker. The cat’s owner would like to have a long battery life so it is convenient and so he or she does not have to change the cat’s tracker’s battery very often. If the battery on the lightweight tracker dies, the cat’s tracker cannot send information to the Cat Watch web application. The cat’s tracker needs to be light and mobile because it needs to be put on the cat’s collar and travel around with the cat. In order to put a longer lasting battery on the cat’s tracker, the tracker will become heavier and less mobile. If the tracker is heavier and less mobile, it would not be as effective for the Cat Watch system because the cat might not want to wear it or it could hurt the cat. If the cat does not wear the cat tracker, the Cat Watch system will not work as effectively.

Some of the harder requirements to support are making the Cat Watch application user interface user friendly and creating a cat friendly and safe cat tracker. Making the Cat Watch web application user friendly can be a difficult requirement. The reason being different people have different opinions of what it means to be user friendly. Our users will have a variety of technical backgrounds, ranging from super technical to not technical at all. A non-technical person might have no idea how to use a website and might not be familiar with certain conventions, such as where to find certain features on websites. The Cat Watch web application design needs to cater to this user and make sure the design is friendly and intuitive enough so that someone with no technical background can easily navigate around the application. A super technical person might be extremely familiar with conventions and expect certain levels of customization features within the application. The Cat Watch application design needs to cater to this user as well to make sure someone with a very technical background does not perceive the website as too rigid with not enough flexibility.

Creating a cat friendly and safe cat tracker could be challenging because cats cannot talk to provide feedback about the cat tracker. In order to get feedback about the cat tracker, Cat Watch designers will have to think like a cat and put themselves in the cat’s position to make sure the tracker is friendly for cats to use and safe for cats to use. Cat Watch designers can also talk to cat owners to get feedback about how cats are reacting to the cat tracker. This requirement could be hard because it might take a couple iterations of prototyping and receiving feedback to get the design correct.

**The Design**

While trying to determine the best design for the Cat Watch web application, I used the suggested approach we learned in HCI 595X Visual Design for HCI course. In this class we read the book, Sketching User Experiences by Bill Buxton. Buxton recommends designers sketch their designs before they create prototypes. Some people believe these concepts of sketching and prototyping serve the same purpose. Buxton does not believe sketching and prototyping are the same by saying, “Sketches dominate the early ideation stages, whereas prototypes are more concentrated at the later stages where things are converging within the design funnel” (Buxton, 139).

Before creating the prototypes in this document, I took a piece of paper and created very rough sketches to consider all ideas for the basic layout and design of Cat Watch. While considering the designs for Cat Watch, one of the design tradeoffs I had to consider was "access to all information vs. simplicity and clarity." One of the issues with the Cat Watch system is the fact that the tracker the cat is wearing is constantly sending information about the cat’s behaviors to the Cat Watch application. The Cat Watch design team needs to determine a way to display the information in a way that is not information overload for the users. Not all Cat Watch users will be technical, so the Cat Watch application needs to be user friendly with a simple and clear way to use the website. If the non-technical Cat Watch users become frustrated or cannot figure out how to use the web application, they will not use the system. This would mean a decrease in sales and usage for Cat Watch. The design tradeoff would be to limit the access to all the information the cat tracker sends to have a simple and clear display of the information. We want to increase the sales and usage of Cat Watch, so the design team needs to decide which information is most important and most relevant to the Cat Watch users and display this information in a simple and clear manner. Only the most important and relevant information will be displayed in the web application. All the extra data the cat tracker is sending to the Cat Watch application will not be displayed to keep the web application simple and clear.

If Cat Watch designers want to display information simply and clearly in the Cat Watch web application, they need to present the information in an organized manner. Organization is key to help the users quickly get to where they want to go on a web page. While investigating different ways of organizing and designing web sites, I came across the book, “The Essential Guide to User Interface design: An Introduction to GUI Design Principles and Techniques” by Wilbert O. Galitz. In the book, Galitz suggests, “Buttons placed on a page imply that the action being performed applies only to that page. Buttons outside the pages imply the action performed applies to all pages… tabs are considered by the user as simple grouping or navigation techniques” (Galitz, 410). These concepts were applied to the Cat Watch web application design by using tabs to group and organize actions and placing links applicable to all the pages at the top of the page, outside tabs.

I took this information and spoke to some users about the design of Cat Watch. They liked the idea of logging into an account and viewing a home tab with information about what your cat’s recent behaviors. Information you could view about your cat’s recent behaviors included daily metrics (number of times your cat ate, number of times your cat drank, number of times your cat used the litter box, number of hours your cat slept, number of hours your cat was active) and an animated video of your cat’s movements with the path your cat traveled throughout your house. The users liked the idea of grouping similar actions in tabs, such as the compare and share tabs. On the compare tab, you can compare your cat’s metrics (number of times your cat ate, number of times your cat drank, number of times your cat used the litter box) against their past metrics. You can view this information in a graph. Users can also compare the number of hours your cat slept and number of hours your cat was active against national averages. On the share tab, you can share questions of your cat’s behaviors and share your responses to other cat owner’s questions. The share tab will display a stream in which Cat Watch users will follow and participate. The users also liked the idea of putting a set of links at the top of the page, not on a tab so you could navigate to them from any tab. These links were for actions that applied to the entire application, such as signing out of your account, configuring your account, contacting the Cat Watch team with feedback and an online help. The concept of the logging in and having an account was used to protect cat owner’s personal data and is a common best practice used when people want to remember certain information related to them.

While creating the design for the different displays of information in Cat Watch, I used some of the principles of display design we learned in our HCI 521 The Cognitive Psychology of Human Computer Interaction course. In this course, we read the book Human Factors Engineering by Christopher Wickens, John Lee, Yili Liu and Sallie Gordon Becker. Some perceptual principles of design display I used were making displays legible and discriminability. All the displays are easy to be viewed with enough white space and appropriate section dividers around them. The designs also have discriminability with distinguishable characteristics. For example, the video looks like a video you could play on YouTube, so it is not confused with metrics being displayed or graphs of metrics being displayed. When the user sees the video, he or she is familiar with how to play the video because it looks similar to how you play other videos. The past metrics graph is similar to any other line graph users can create in MS Excel or another data plotting tool. The activity stream is very similar to other social media tools where you post information and respond to information others have posted. Some label design principles I used were visibility/ legibility, meaningfulness and location. All the labels used to identify the different sections were marked in a clear and easy to read font for a website, a sans serif font called, Calibri. The section labels were also bolded to make them more visible compared to ordinary text. All the labels are meaningful and add insight to help the user identify what section he or she is viewing. The location of all the labels is consistent across the application, above the section and on its own row (Wickens et al., 185-195). The feedback I received from my users about the website display design was it, “looked clean”. This feedback lets me know I applied these display design principles in an effective manner.

One piece of the Cat Watch system is the web application and the other piece of the Cat Watch system is the cat tracker that sends data about the cat’s behavior to the web application. We discussed the design of the Cat Watch web application and there is a user story below with screenshots from the application. One major design tradeoff with the Cat Watch cat tracker is "long battery life vs. mobility". The cat tracker will be attached to the cat’s collar and will travel around with the cat. The design of the cat tracker has to be safe and desirable for the cat or the cat will not want to wear the cat tracker. If the cat does not wear the cat tracker, the Cat Watch system will not work because there will be no data to view on the web application about the cat’s behaviors. At the same time, we want the battery life of the cat tracker to be a good length of time because the cat owner does not want to be constantly replacing the tracker’s battery. If the battery in the tracker dies, it cannot send data about the cat’s behaviors to the Cat Watch servers and the Cat Watch web application.

Since the cat tracker is such an integral part of how the Cat Watch system works, it is crucial the design of the tracker is safe and appealing to the cat. If the cat will not wear the tracker or it is unsafe to wear the tracker, the Cat Watch system cannot work effectively. As a result, the tracker’s design will be driven with what is most comfortable and convenient for the cat. According to the feline advisory bureau owners website, cat owners should not put heavy, unnecessary bells and other things from their cat’s collars because it presents possible dangers. Cats can get these bells and other things caught and have trouble getting out of a potentially dangerous situation (Cats, 2012). Cat Watch recommends cats wear the break away collars to help prevent any dangers while using the Cat Watch system. After considering all these design options, the cat tracker will be made light weight to not harm or affect the cat with a break away clasp in case the cat gets stuck on the tracker. The battery in the tracker must be long lasting and light to support the light weight design. After talking to cat owners about the design of the cat tracker, they agreed with my design choices. They believed the tracker needed a break away clasp to keep the cat safe and the tracker needed to be light weight to not harm or negative affect the cat.

For all the reasons listed above, I decided to use the designs and principles discussed above in the Cat Watch system. The design can be seen and is described in the user story below. Below is an example of a user story that includes several requirements and tasks from the Cat Watch system:

Bill and Jackie Smith were married in June 2011 and decided to get a cat in July 2011 named, Louie. Bill and Jackie planned to take a vacation in November 2011 to New Zealand, but were concerned about leaving Louie because they could not see what Louie was doing each day. This trip would be the first trip they would leave Louie home alone. They planned to have a cat sitter feed Louie twice a day, but they wanted to make sure their cat Louie was exhibiting healthy and normal behaviors while they were not home. Specifically, Bill and Jackie were interested in making sure Louie was doing the following while they were away:

* Eating as many time as he normally did
* Drinking as many times as he normally did
* Using the litter box as many times as he normally did
* Sleeping as many hours as he normally did
* Being active as many hours as he normally did

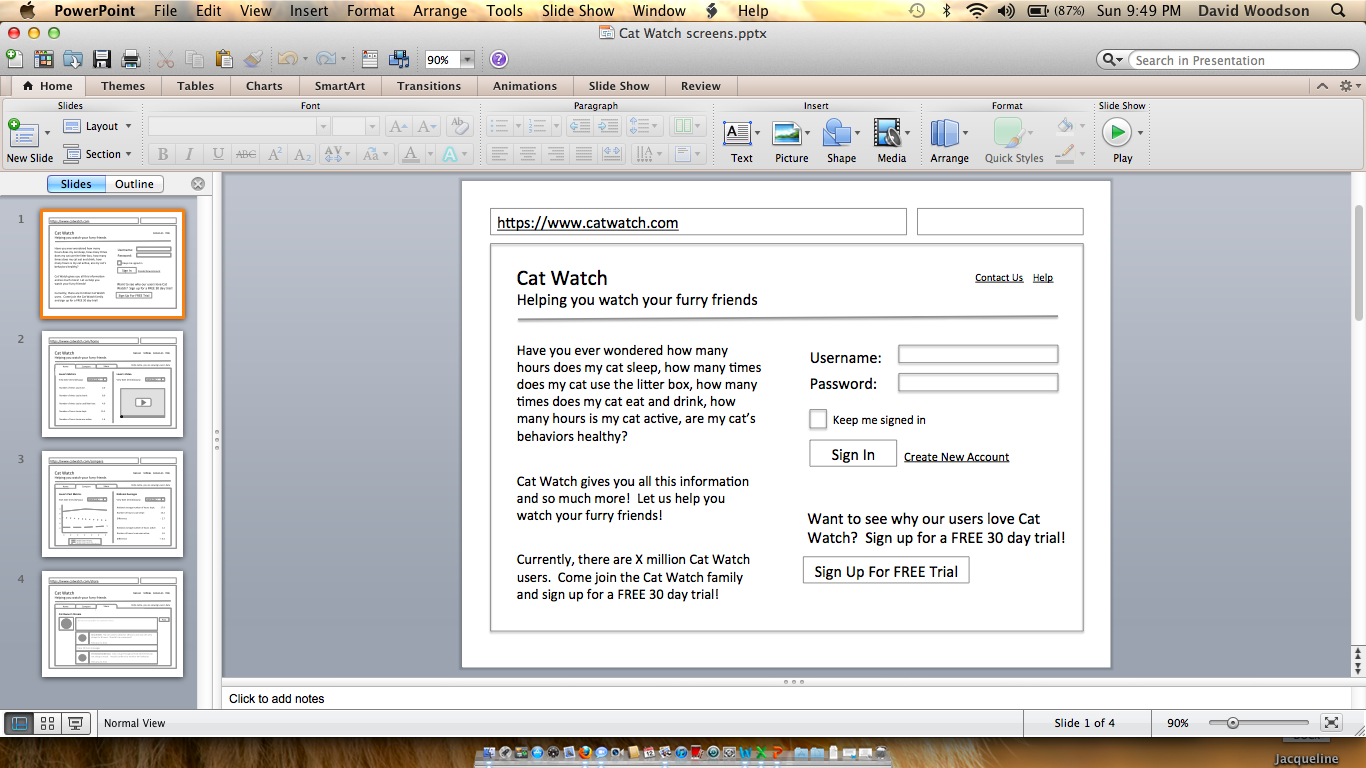
In September 2011, Bill was doing some investigation online and came across the Cat Watch system. Bill showed Jackie the system and they decided to use the Cat Watch system immediately because it helped them know what Louie was doing when they were not home. They realized Cat Watch could help them monitor Louie’s behaviors when they were in New Zealand and it could help them monitor Louie’s behaviors any time they were away from home.

Bill went to the Cat Watch website, please view the screen below. He noticed Cat Watch offered a free 30-day trial and figured it would be good to try out the product before paying for the product. Bill clicked the Sign Up For FREE Trial button and filled in all the information required for a free trial. Cat Watch sent Bill and Jackie a cat tracker for Louie and instructions on how to activate the tracker and create an online Cat Watch account.

When Bill and Jackie received the Cat Watch cat tracker in the mail a couple days later, they followed the instructions to activate the cat tracker and attached it to Louie’s collar. Please see the image below for a view of the cat tracker. It is a very small and light tracker with a clasp that allows users to attach the tracker to their cat’s collar. The cat tracker is very lightweight and Louie did not even seem to notice it was on his collar. At first, Bill and Jackie were a little concerned the cat tracker might annoy Louie, but when they saw how light weight it was, they knew it would not bother him.

To create their Cat Watch online account, Bill went back to the Cat Watch website, please view the screen below. Bill clicked on the Create New Account link and filled out the information required to create an account. Some of this information required included a user name, password, security questions, Louie’s cat tracker ID, etc.

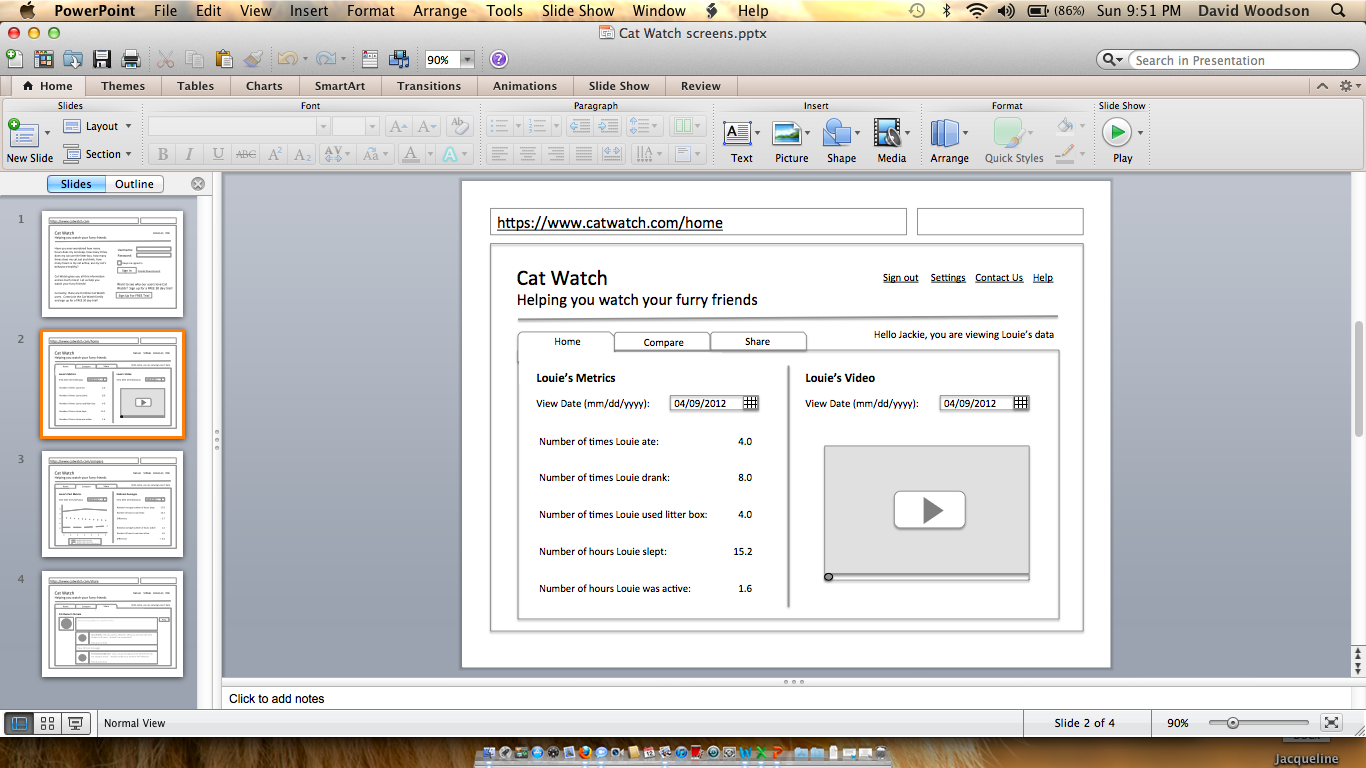
After setting up Louie’s cat tracker and creating the online Cat Watch account, Bill and Jackie logged into the Cat Watch web application. To login, they went to the Cat Watch website, please view the screen below. They entered their user name and password and clicked the Sign In button.



After Bill and Jackie’s credentials were validated by the Cat Watch system, the home page below displays. Bill and Jackie only have one cat, Louie, so they were not prompted with the screen that asks the users to select which cat they would like to view. Bill and Jackie clicked the Help link to learn more about how to use the Cat Watch application. The online help had training videos and frequently asked questions available for users.

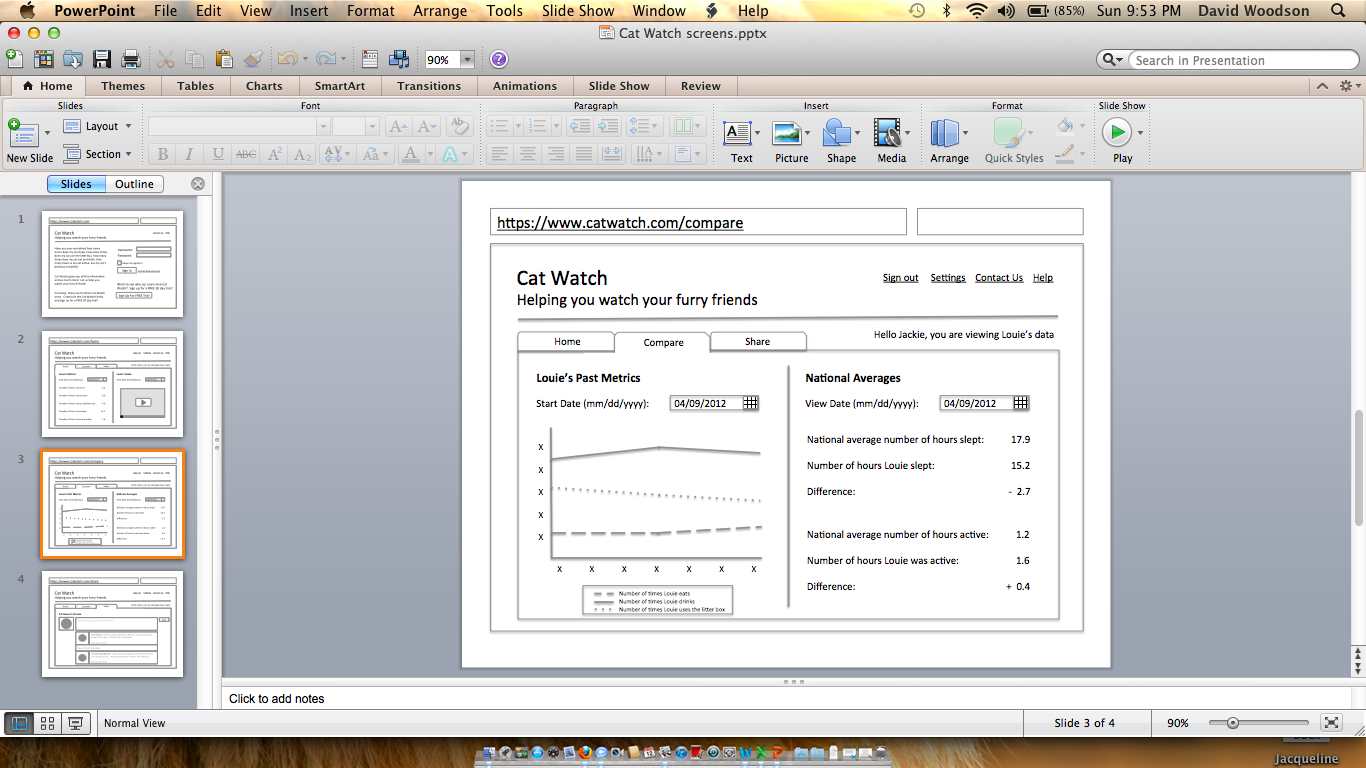
After understanding how to use the Cat Watch application, Bill and Jackie wanted to configure the Cat Watch application with their settings, so they clicked on the Settings link. While configuring their settings, they were able to upload a diagram of their house, indicate where Louie ate, drank, used the litter box and the location of some of his favorite places to sleep. After they completed configuring the settings, they clicked the Sign Out link to log out of their account.

A couple days later, Bill and Jackie signed back into their account successfully, as described above, and the home page below displayed. Bill and Jackie knew it was the correct account because Cat Watch used their name and Louie’s name. On the home page, Bill and Jackie could view Louie’s metrics, such as number of times he ate, number of times he drank, number of times he used the litter box, number of hours he slept and number of hours he was active. They could select the day they wanted to view Louie’s metrics in the drop down menu. Bill and Jackie could also view a video of where Louie went through out the day by clicking the play button. In addition, they could stop the video, move forward in the video and move backward in the video using the video timeline under the video. They were able to select which day they wanted to view the video in the drop down menu.



It was important for Bill and Jackie to know that Louie’s behaviors were consistent over time and that his behaviors were relatively close to national averages. To do these comparisons, they would login to the Cat Watch system, as described above, and click on the Compare tab and the screen below displayed.

On the compare tab, they could view Louie’s past metrics (number of times he ate, number of times he drank and number of times he used the litter box) compared to his current metrics in a graph where they could identify trending. The drop down menu allowed Bill and Jackie to select the first day in which they would like to start to compare Louie’s metrics against, so they could specify what time frames they would like to do comparisons. Under the national averages section, Bill and Jackie can compare and analyze the number of hours Louie slept and the number of hours Louie was active to the national averages. They can select the day they wanted to compare Louie’s metrics vs. national averages.



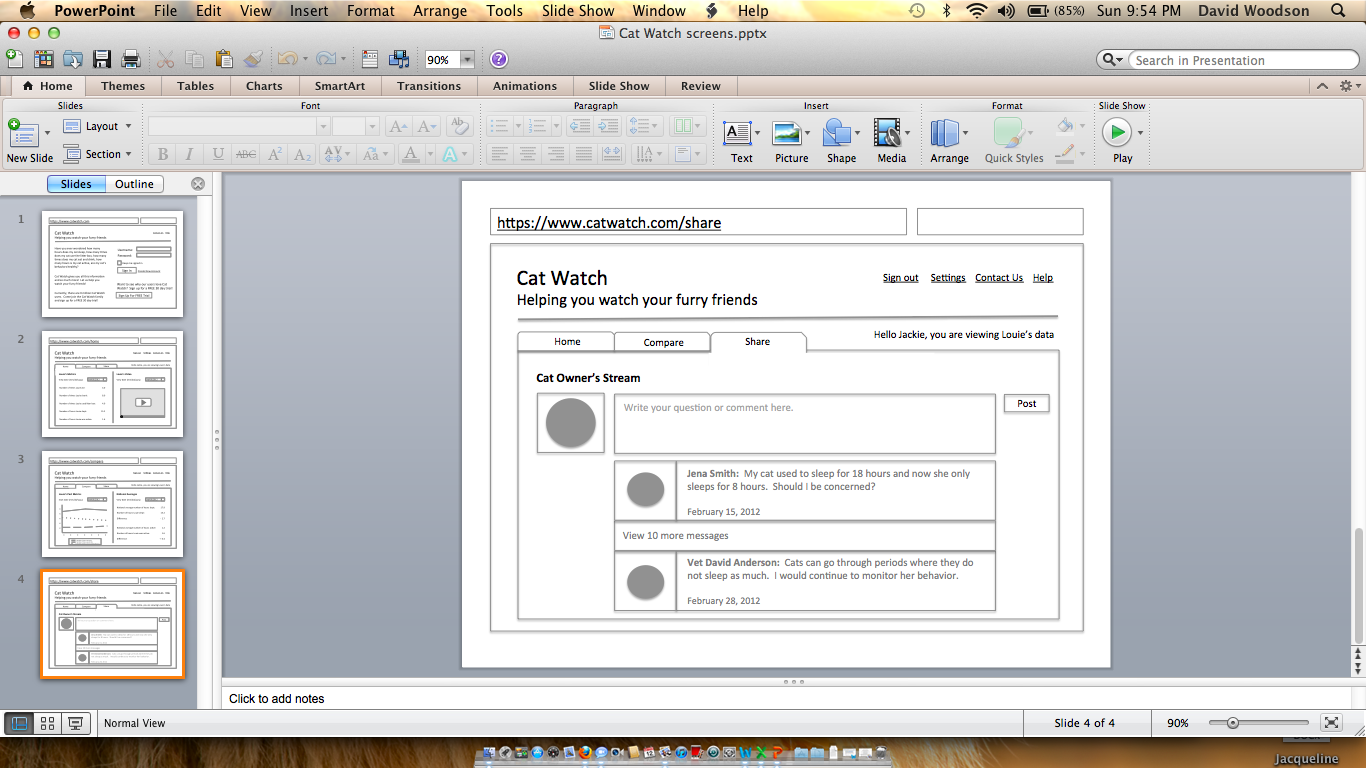
Cat Watch provided Bill and Jackie with a lot of information on Louie’s behaviors. Every now and then Bill and Jackie would notice something unusual in the trending of Louie’s behaviors. For example, there was a period of time when Louie did not eat and drink as much as normal and Bill and Jackie became concerned. They were easily able to identify the unusual behavior using the graph under Louie’s past metrics. They noticed a steep decline in the number of times Louie ate and drank.

Normally, they would become concerned with the behavior and discuss whether they should take Louie to the vet. With the Cat Watch system, they knew there was an easy way to discuss any concerns about their cat with the Cat Watch community.

Bill and Jackie logged into the Cat Watch application, as described above, and clicked on the Share tab. The share tab displayed a stream of questions, responses, comments and suggestion for cat owners, vets, etc. Bill and Jackie can post their question about Louie’s changes in the number of times he eats and drinks by typing in the question and clicking the Post button. These actions will post the question to the stream and allow other cat owners and vets to respond to their question.

Bill and Jackie can also read through other Cat Watch users questions to see if anyone shares similar thoughts or concerns. They can read the entire thread of discussions by clicking on the View 10 more messages link. If they would like to contribute to a discussion, they can post a response to another Cat Watch user’s question or they can post a comment about another cat’s behavior.

If Bill and Jackie have any questions, comments or suggestions they would like to share with the Cat Watch team, they can click the Contact Us link and provide feedback.



After the 30-day free trial period is over, Bill and Jackie decide they love they Cat Watch application. They received a letter in the mail telling them their free trial period has ended and if they would like to continue using Cat Watch, they need to select a method and frequency of payment. Bill and Jackie logged into the Cat Watch application, as described above, and clicked on the Setting link. They are able to indicate they would like to pay for Cat Watch yearly using their American Express credit card.

When Bill and Jackie have completed their Cat Watch application session, they click on the sign out button to log out of their account.

**Future and Emerging Technologies**

Some future and emerging technologies that could affect the Cat Watch system include the mobile, artificial intelligence and ambient intelligence fields.

The mobile field is a field that exists today, but continues to emerge and expand. Within the past few years or so, the mobile trend has really exploded and caught on in our world. Our fast paced lives have quickly adopted smart phones with mobile apps and tablets with mobile apps to allow mobile access at your fingertips, anywhere and anytime. With the high adoption of mobile technologies in both our personal and business lives, Cat Watch has already started planned for how it will integrate mobile into its system. Cat Watch’s first release will be as a web application, but in the near future, Cat watch will expand into the mobile arena and create a mobile app. The mobile app will allow you to login to your Cat Watch account, view your cat’s behaviors and compare your cat’s behaviors while you are on the go.

According to an article called, “Towards a theory of mobile learning” by Mike Sharples, Josie Taylor and Giasemi Vavoula, it looks like we can apply some of the mobile learning principles to the Cat Watch mobile application (Sharples et al., 2005).

As Cat Watch communicates information about the cat’s behaviors to the user, it is enabling its users to learn about their cats’ behaviors. Some of the principles in this article apply to Cat Watch’s future mobile app design, such as the learner and knowledge centered and community centered practices. The learner and knowledge centered principle will be applied by making sure the Cat Watch user has the real time cat behavior information they need to make informed decisions and conclusions about their cat’s behaviors. The community centered principle is implemented to a degree with the activity stream on the share tab, but the Cat Watch mobile app can integrate with Facebook, Twitter and other social media tools to really enhance the community experience and draw on a larger audience.

Artificial intelligence is another emerging technology field. There has been a great of progress made in the artificial intelligence world with making computers and technology smart and giving them intelligence. Simulating the human brain is difficult because we are still learning about how the brain works. As we continue to learn about the human brain, artificial intelligence will continue to emerge and change. One way artificial intelligence could affect the Cat Watch system in the future is with the sharing information feature. Instead of waiting for humans to respond to the activity stream on the share tab, an artificial intelligence computer might read the question and immediately come up with an appropriate response. Having a computer read and respond to users questions would probably increase more discussions on the activity stream because the response to your question would be almost immediate. The intelligent computer could be knowledgeable in the cat anatomy field and could respond to questions, similar to how a vet might respond.

Another emerging technology is the ambient technology field. In my research on Google Scholar, I am across the book, “Ambient Intelligence: The Evolution of Technology, Communication and Cognition Towards the Future of Human Computer Interaction” by G. Riva, F. Vatalaro, F. Davide and M. Alcaniz. According to this book, “humans will, in an Ambient Intelligent Environment, be surrounded by intelligent interfaces supported by computing and networking technology that is embedded in everyday objects such as furniture, clothes, vehicles, roads and smart materials – even particles of decorative substances like paint” (Riva et al., 47). The ambient intelligence field is embedding technology seamlessly into the world around us.

This technology could affect the design of the Cat Watch system. In the first release of Cat Watch, users will have to login to the Cat Watch web application to view data about their cat’s behavior. In the future, when Cat Watch is integrated with ambient technology, the user might not have to login to the Cat Watch web application to learn about their cat’s behavior. When the users come home from being on vacation, the ambient intelligent environment in their house might automatically know when to fill the user about the cat’s behaviors. Maybe when the user calls the car, plays with the cat or interacts with the cat, the ambient intelligent environment in their house will know they are ready to learn about their cat’s behaviors while they were away.

**Ethical and Social Implications**

There might be some ethical issues and social implications that arise from Cat Watch. The Cat Watch team is doing their best to minimize any negative impacts from these issues and this section is designed to discuss the issues.

When a user signs up to use the Cat Watch system, he or she must sign a form saying they have read and acknowledge how the Cat Watch system works and they are okay with it. This form helps legally protect the Cat Watch system.

The Cat Watch cat tracker is worn on the collar of the pet cat. The cat tracker will send data about the cat’s behaviors to the Cat Watch servers and the servers will send data that will be displayed in Cat Watch to the application. Some of the data collected from the cat tracker includes the cat’s locations, from which an animated video is created and displayed on the Cat Watch web application. While collecting this data, it is possible the cat tracker could capture data about other people in the house, such as their location, proximity to the cat (if the cat is taking a nap on his or her owner’s lap), etc. This information would be sent to the Cat Watch servers. This information would never be sent to the Cat Watch application for users to display because the only information sent to the application is the information displayed.

Cat Watch is doing several things to minimize the impact of the cat tracker capturing data about other people in the house. The cat tracker is not taking any video footage to protect the privacy of other people in the house. The reason actual video footage of the cat is not captured is to prevent the situation where someone in the house is changing or going to the bathroom and the cat happens to be in the person’s view. Instead, the cat tracker captures the cat’s different locations and an animated video of where the cat has been in the house is created from the cat’s locations and the user’s uploaded diagram of his or her house.

The Cat Watch application is encrypting all data sent from the cat tracker to the Cat Watch servers to the web application. In the event the cat tracker captures some data about the location of people in the house, the data will be securely transported to the servers. This encryption should help limit people trying to access this data to get some information of what is going on within the house. The data is secured on the Cat Watch servers and only authorized access is allowed to the servers and the data. Cat Watch has a policy and a process to remove captured data that is not being used and sent to the Cat Watch web application. In this process, the collected data is reviewed every couple months and any unused or non-applicable data is removed permanently from the Cat Watch servers.

In the unlikely event data about people in the house is captured by the cat tracker, Cat Watch users can be assured that no video footage is taken, all data is transported securely and any unused collected data will be removed from the Cat Watch servers in a routine process every couple months.

One social implication the Cat Watch system could have would be impacting the staffing needed at animal shelters and pet stores. Currently, animal shelters and pet stores might have dedicated staffing to take care of cats that are looking to be adopted and find a home. Part of the cat caretaker’s job is to monitor and track the cats and identify any abnormal behavior. If we replace the responsibilities of the people who monitor the cats and identify the abnormal behavior with the Cat Watch system, we can decrease the number of staff we will need to support this activity. We will need people to view the trends on the Cat Watch web application, but we will no longer need staff to track and record all the cats’ behaviors. Reducing staff or staff hours will lower costs for animal shelters and pet stores. Implementing Cat Watch will also help animal shelters and pet stores keep better records of their cats’ behaviors.

Another social implication Cat Watch could have would be impacting the amount of time people on vacation spend online. If Cat Watch users are using Cat Watch to help monitor their cats when they are on vacation, they might be more inclined to login to Cat Watch and check up on their cat while they are on vacation. This event would increase the amount of time people on vacation spend online. It is not necessarily a bad thing, but if the vacation is a family vacation, it could decrease the amount of time the family spends together because at least one of the family members is online checking up on the family cat.

**Works Cited**

Buxton, B. (2007). *Sketching User Experiences*. San Francisco, CA: Morgan Kaufmann Publishers.

Cats and collars. (n.d.). *fabcats : feline advisory bureau - the website dedicated to feline wellbeing*. Retrieved February 13, 2012, from http://www.fabcats.org/owners/safety/collars/info.html

Galitz, W.O. (2007). *The Essential Guide to User Interface design: An Introduction to GUI Design Principles and Techniques.* Indianapolis, IN: Wiley Publishing, Inc.

Riva, G., Vatalaro, F., Davide, F., Alcaniz, M. (2005). *Ambient Intelligence: The Evolution of Technology, Communication and Cognition Towards the Future of Human Computer Interaction.* Amsterdam, The Netherlands: IOS Press, Inc.

Sharples, M., Taylor, J., Vavoula, G. (2005). Towards a Theory of Mobile Learning. Retrieved from: [http://www.lsri.nottingham.ac.uk/msh/Papers/Towards%20a%20theory%20of%20mobile%20lea rning.pdf](http://www.lsri.nottingham.ac.uk/msh/Papers/Towards%20a%20theory%20of%20mobile%20learning.pdf)

U.S. Pet Ownership Statistics: The Humane Society of the United States. (n.d.). *The Humane Society of the United States: The Humane Society of the United States*. Retrieved February 13, 2012, from http://www.humanesociety.org/issues/pet\_overpopulation/facts/pet\_ownership\_statistics.html

Wickens, C.D., Lee, J.D., Liu, Y., & Becker, S.E.G. (2004). *An Introduction to Human Factors Engineering* (Second Edition). Upper Saddle River, NJ: Pearson Prentice Hall.