Melissa Gfeller

Project Management – 6162

12/7/2018

Mobile Survey Application for the Department of Natural Resources

Description of the Project

The Utah Department of Natural Resources conduct hundreds of surveys to determine the health of native Utah species and their habitats. These surveys cover the entire state of Utah from mammals to amphibians. All of these surveyed creatures are endangered and crucial to the health of the ecosystem. To cover the state the Department of Natural Resources are assisted by the Utah's Hogle Zoo and the Wild Utah Project. Both employees and volunteers contribute to these annual surveys. The amount of surveys continues to increase each year as more volunteers give their time to survey endangered species. With the number of surveys increasing it only makes sense to streamline the data collection methods. This project will produce a Mobile Survey Application that will remove the data input step for the Department of Natural Resources. This will save them time and money for each survey they do not have to manually input into their excel spreadsheet. The application will also standardize the data received from each of the five regions.

The Department of Natural Resources is prepared to fund a project up to $200,000. While the current estimate is $165,000 there is a small fund for possible overruns. Most of the money goes to the creation of the mobile application and the database to store the survey data. The initial cost will be high but the future savings will be well worth the transition. The first step of this project requires the digitization of the paper surveys into Survey123. Once completed the

challenging part is to determine the storage of the survey data. There needs to be a database that can store all the data for each survey species.

For the Boreal Toad species there are 114 field sites across Utah that need to be surveyed multiple times annual. Having the help of volunteers and citizen scientists is a great way to cover all the field sites. If the Department of Natural Resources had a geospatial database for their data they would be able to expand their analysis of endangered species. This is a very important task because species like the boreal toad populations as well as other amphibians are being killed by chytrid fungus. The chytrid fungus is deadly because it coats an amphibian's skin. The direct cause of death is unknown but given that amphibians drink and breathe through their skin this could make both those tasks impossible. High altitude species like the boreal toad are particularly vulnerable because of the specific conditions required for survival. Boreal toads are not the only species that needs to be monitored just one example of why these surveys are so important. It would be great if the Department of Natural Resources could spend less time inputting data and more time out collecting the necessary population health information.

Scoping of the Project

For this project the scope is broad including the entire state, Department of Natural Resources employees, and volunteers from multiple organizations. The need to track the health of endangered populations is continuing to grow. The Utah's Hogle Zoo and the Wild Utah Project use volunteers to help assess these struggling populations. A statewide mobile application that can be used by employees and citizen scientists would help to increase efficiency and decrease the data input time. The standardization across the regions is in an invaluable feature a mobile application could provide.

Main Product Characteristics and Requirements:

1. Mobile Application: The application must contain the Utah Division of Wildlife Resource surveys.

2. Imagery Uploads: Survey images can be uploaded with the survey data. Images are linked to either environment or the survey species.

3. Compile Data: The data submitted from the survey application is compiled in and excel spreadsheet.

4. Data Access: The survey data is accessible to the Utah Department of Natural Resources from a computer for quality control and data analysis.

5. Data Security: The data in only accessible with proper authorization by the Utah Department of Natural Resources.

6. Offline Availability: The application needs the ability to store data offline and then submit surveys at a later date. Surveys can take hours and there may not be internet access.

Business Case of the Project

The main objective of this product is to develop a standardized data collection method for the state of Utah. A mobile application that will save time and money for years to come. This is a great initial opportunity to develop a mobile application for the Utah Department of Natural Resources. If this venture is successful then the mobile survey application can be expanded to other states. With no current applications on the market that has the features the Department of Natural Resources requires leaves only the last option to create a new mobile application. This will be an initial expense but will payback in later years.

Knowledge Areas

1. **Scope**

    The scope for this project is extremely large. To create a mobile survey application with the number of features requested for the entire state is ambitious. The benefits of such a large venture will be large. If the whole state transitions from paper to digital together it will be a smoother process. This will help all the regions acclimate to the new procedures together.

2. **Time**

    The expected time for the project is 6 months. This is a short amount of time but also leaves time for testing phases. The development stages are straight forward and specified within the Gantt chart. The testing phase is the flexible part. If there are a lot of changes that need to be made based on user feedback then the testing phase could increase past 6 months. Depending on the types of feedback received by the Department of Natural Resources and the volunteers the time frame for completion will shift.

3. **Cost**

    The funds allocated for this project by the Department of Natural Resources is $200,000. When creating this budget some of the main concerns were the GIS software that the Department of Natural Resources use and the numerical benefits of having such a mobile application. After finding out that the Department of Natural Resources already have a subscription to ESRI, that became a large expenditure that is exempt from the budget. The estimated cost for the entire project is $165,000 with a payback period of 4 years. The payback

period is based on the benefits being around $60,000 per year. If this estimated value is actually less than the payback period increase to more years.

4. **Risk**

There are always risks when developing a project. Some include the cost and whether the development of the project is worth the initial expense. For the Department of Natural Resources to transition from paper to digital will result in a large initial expense. The benefits for future years make up the cost of such an investment. The estimates for this project are expected to pay back the initial cost within 4 years. For the Department of Natural Resources this is very good because they will continue to conduct annual surveys. This will benefit the Department of Natural Resources long into the future unless they stop conducting surveys. Even in the payback time period lasts longer than 4 years the benefits will continue if they continue to survey. Another risk is the complexity of the mobile survey application. If the application is too challenging to use then not everyone will find it useful. The best way to manage this risk is to use a simple program like Survey123. I created a test application on Survey123 which was simple to create and easy to use. When implementing a new system there could be push back from employees who do not like change. To manage this risk start with one region first and choose a region who are motivated to make the transition.

5. **Stakeholder**

The most influential stakeholder if the Department of Natural Resources. This project is mainly focused on their yearly surveys. Based on the large number

of endangered and threatened species throughout Utah it is important to survey them to track further decline or an increase in numbers. This is crucial to determine the health of these populations. Surveys are extremely important to this effort. Without surveys the Department of Natural Resources would only be able to guess at the health of these endangered populations.

A minor stakeholder for this project include the Utah's Hogle Zoo. They are not the main focus for this project but they will need to be trained with this product. The Utah's Hogle Zoo has worked with the Department of Natural Resources for many years to assist in the survey process of various species. In particular the Utah's Hogle Zoo focuses on Boreal Toad Surveys because they are a local Utah species and part of the Zoo's Big Six program for conservation efforts. Employees and Volunteers alike contribute to the number of Department of Natural Resources surveys that are completed each year. This year alone the Utah's Hogle Zoo contributed over 150 Boreal Toad surveys. The Utah's Hogle Zoo also assist the Department of Natural Resources with black-footed ferrets and various bird surveys.

The Wild Utah Project is also a less influential stakeholder for this project. They are a stakeholder because they assist the Department of Natural Resources in various surveys but they are only a small portion of the total surveys. This year the Wild Utah Project contributed about 70 Boreal Toad surveys. The Wild Utah Project is versatile and helps the Department of Natural Resources to survey and create beaver dams. Even with all this help the Department of Natural Resources

conduct the majority of surveys completed annually which is why they have the most influence on this Mobile Survey Application project.

6. **Human Resources**

Human resources is a challenging opportunity to work with different people. Whenever people work in close quarters there are chances for disagreement. Internal human resources focus on the interactions of the group. For this project making sure that my three employees are working successfully together is the key. The challenge is to manage different personalities so that everyone feels comfortable and confident working in the group.

The other human resources for this project is going to be external. A large part of the external human resources involves training people on the product. The initial training will be done by my employees for the Department of Natural Resources Staff. They will have an opportunity to give feedback which my team will implement. Then the next testing phase is supervised by my employees, with training done by the Department of Natural Resources staff for the volunteers and citizen scientists.

Successful Parts of the Project

One of the most challenging parts of the project was creating the budget. I have never had to create a budget for a project before. I never considered the steps that went into planning a large scale project like this. Having to account for salaries, benefits, hardware, software, travel and other aspects is a lot of work. This was a great experience learning how to think when creating a budget for a project. This unique opportunity gave me a chance to develop my skills for budget creation. When the budget was complete I was very proud of the work I put in. After

many adjustments the cost and the benefits seemed reasonable and fit my proposed budget estimate.

The Gantt chart was mostly a success. That was yet another challenge to complete having never created one before it was fairly simple learning the program. The greatest challenge was attempting to estimate the time it would take to complete various tasks. The way to develop these estimates would be through experience. This was my challenge because I had no concept of the time it would take to complete these tasks. I did my best to estimate the number of surveys to digitize and the scale of the database to estimate a reasonable amount of time.

One of the easier parts of this project was the stakeholder management. Of all the other parts this knowledge area made the most sense to me. The opportunity to develop strategies to work with different organizations and different personalities. Being able to breakdown what people say and do so you can better portray your message is a powerful tool. That knowledge area was the most fun for me to complete.

Another unique part of the project was creating my teammates. Those members of the programming and design team that would be creating the project. After making them up and having to pay them salaries and benefits was a bizarre experience. Continuing to think about my workers I suppose I never thought to account for the possibility of sick days or holidays.

I thought that the work breakdown structure was going to be very easy but starting out I struggled. Trying to figure out all the components and the development stages. Having never created a mobile application before it was hard to understand the right steps. I discussed the development with my classmates to get a better sense of the process. This turned out to be very

8

helpful and I received great feedback. It allowed me to branch off from their advice and develop my current work breakdown structure.

Unresolved or Failed Components of the Project

There were a lot of challenges throughout the project many simply took time to overcome. One of the biggest challenges was the Gantt chart formatting. Besides the fact I had never created a Gantt chart before the process was very straight forward until I had to add the order of "precedence". By the time at attempted to add this step I had already set dates for these tasks. This turned out to be very frustrating because when the order was set it would automatically change the dates and overtask my employees. Also when the dates were changed it would have them working on Saturday and Sunday. After doing research into this problem I was still unable to solve the issue. Having spent all this time making sure my employees tasks did not overlap and they were not scheduled for weekends it was frustrating to not have the correct final layout I had planned.

I was unable to receive exact numbers from the Department of Natural Resources about the average number of surveys they completed last year. Given some values for Boreal Toad surveys I was forced to estimate the number of surveys completed annually by the Department of Natural Resources plus the surveys completed by volunteers.

There should have been a small scale test of the survey by the developers to make sure the process works. When I was first developing the work breakdown structure I did not think to test the system early. Now that I am looking back that would be the best way to ensure there are no initial problems. If all the surveys were to be digitized and none of them worked that would be a huge problem. Testing early will eliminate this issues and could even solve small problems.

Better to fix any issues early before all the surveys are digitized. Another aspect I had not thought about was to decrease the scale of the project. If only a couple surveys were digitized and only one region tested it. Creating a smaller focus with and eager group could help more stubborn regions better adjust to the new data collection methods.

Human resources was a challenging knowledge area for this project. It is difficult to develop strategies to work with imaginary employees. When I choose it I thought it would be relatively easy considering I would be helping to train Department of Natural Resources staff and volunteers. I did not even think about the interactions between my own employees and our working relationship.