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Collaborative Environmental Monitoring in a UNESCO Biosphere: A Pilot Project in the Mount Arrowsmith Biosphere Region Vancouver Island University

Project Summary

Part I. Description

Participating organizations:

Vancouver Island University

Background or problem statement

In recent years there has been a pressing societal demand for a new approach to managing and evaluating local environmental systems. One of MABRRI's main goals is to increase the connection between people and nature. We believe that by harnessing the knowledge of the MABR community and the interdisciplinary strengths of students and faculty at Vancouver Island University, we can be a centre for collaborative research, innovation, and knowledge sharing that elevates the relationship between people and nature in the biosphere region. This is the idea behind our Collaborative Environmental Monitoring app. By developing a modern, web-based application we hope to engage younger audiences in environmental action and awareness. Our app attempts to evaluate the state of our local environmental systems through the eyes of those that spend the most time enjoying them – we allow the community to tell us what they think about their surroundings, and we can then work towards fixing any issues they point out. Identified trends in prevalent invasive species, impassible fish barriers, or illegal dumping for example, will allow us to work towards fixing these issues faster and more efficiently than if we were researching these issues on our own. Our app is a replicable social innovation that can be used as a template for other regions in the world, and thus has the potential to help improve the state of our global environment.

General description of the project

The Collaborative Environmental Monitoring App was developed in 2016 and was spearheaded by Vancouver Island University (VIU) and the Mount Arrowsmith Biosphere Region Research Institute (MABRRI). This project takes a participatory approach to solving complex environmental issues and aims to stimulate new ways to deal with local environmental challenges. The app has equipped VIU students and faculty, as well as community members with an easy-to-use platform with which they can provide feedback and disseminate environmental information that is of interest to them. For example, users can record observed features (e.g. indigenous plants of cultural significance, recent landslides, or culturally modified trees), or issues (e.g. cougar sightings, invasive species and illegal dumping). The app records data in real time using handheld devices, such as cellphones or tablets. Information collected by citizens is reviewed by MABRRI staff and incorporated into a "living" community map linked to the MABR app. Recorded data then becomes available to all registered users, who are able to find their way to points of interest or upload their own environmental information. Identified trends in the collected data will be discussed at the MABR roundtable meetings to ensure that all jurisdictions are aware of potential pressing environmental issues. Together, the Roundtable members can work towards addressing these issues and preventing them moving forward.

Description of outcomes and follow-up

Our team has successfully created the MABR Collaborative Environmental Monitoring App, which aims to address environmental issues in a collaborative way. Throughout the development of the app, we have achieved all the goals and objectives outlined in the funding agreement. Although we have not had the opportunity to officially launch our app yet, it has already been used. To date, we have approved 82 submissions. However we have had to decline, for various reasons, approximately 50 others, meaning that even with little promotion our app has been used well over 100 times in just over 6 months. After

analyzing this data, specifically the type of each submission, we have already begun to find trends in environmental issues in our region. For example, 12.20% of the submissions have been categorized as Invasive Species, with most of the attached photos being Himalayan blackberry, suggesting a need to remove this prevalent species from some of the areas that residents are trying to enjoy. Thus, it is safe to say that our project has already achieved recognition of its value and importance in our region. With an official launch we can expect to see increased usage and more clearly identified trends.

Project Summary

Part II. Analysis

Successes

Our most significant success was the development of the app itself – creating a relevant, easy-to-use app that worked seamlessly on two different platforms was not an easy task. Our team of students conducted extensive research on existing environmental applications and determined how we could build off of already established platforms; this allowed the app developers to create a strong template in the early stages of the project. After trialing the app with the community, we were able to take their suggestions and enhance the app's applicability even more, particularly with the inclusion of the RDN. The app is now relevant to well over an additional 100,000 residents and many other environmental and governmental organizations – much more than we originally anticipated. With little promotion, the app is already being used and we have already begun to see trends in the data. With an official launch in the near future, we expect an increase in usage and visible trends. Overall, we are quickly moving towards increasing the widespread flow of environmental knowledge within the MABR and the RDN.

Challenges

Our team has encountered four main challenges throughout this project. The first was finding consultants that were able to produce an app that works for both iOS and Android devices. In original discussions, we spoke with consultants that had experience with one or the other – not both. The developers we worked with ended up encountering different issues unique to each platform, making the app difficult and time-consuming to produce. Consequently, the cost of production of the app was higher than we anticipated. The second challenge we faced was related to the amount of time required to gain ethical approval from VIU. As mentioned before, the VIU Research Ethics Board requires an ethical review process for any research projects that involve human participants. Thus, this process was required before our team could survey and speak to the community about trialing the application. This slowed us in gaining the community's feedback that would help us ensure the application met our users' needs. However, we were eventually able to obtain approval and move forward with the project.

Our third challenge was related to the second. After receiving community feedback, we then had the daunting task of trying to adapt the app to address the many recommendations. Numerous meetings between our research team and the app developers were required in order to analyze the data and determine which changes would take place. This process took more of our budget than initially expected. However, we feel that we have done our best to accommodate the needs of the community.

Finally, our fourth challenge was in regards to coordinating with other environmental organizations to promote the app at their meetings and events. We originally wanted to launch our app locally first within the MABR, and then in the Regional District of Nanaimo, at the annual Water Day. Due to the challenges listed above, we were only able to do the first – facilitate a small launch at our 2017 MABR BioBlitz.

Lessons Learned

Our most important lesson learned throughout this project was that the development of an application is much more costly and time-consuming than we initially expected. Issues can arise at any time, and are likely to occur more frequently when attempting to create an app on two different platforms simultaneously. Moving forward with this project, our team hopes to secure future funding with partners so as to establish a contingency fund that will ensure that any lack of funding does not impact the future of this project.

We also learned that gaining ethical approval at Vancouver Island University is a lengthy, but very necessary, process. At the beginning stages of this project we were halted for months because of this. This unanticipated issue caused the launch of the app to be pushed back. As a new institute, we had not encountered this issue before. With future projects we will be able to work potential ethical review processes into project timelines so as not to delay future project end-dates.

These experiences allowed our team to learn about different requirements within the university and the importance of having a secured contingency fund related to unexpected research costs. Our lessons learned can be used to ensure that future collaborations with regions looking to duplicate our work will reflect that of not only our successes, but our challenges as well..

What Next? What will you do and what should others do?

Moving forward, our first priority is to facilitate an official launch event for the app. Although we have shared the app internally, with environmental groups, and with everyone that attended the 2017 BioBlitz (approximately 70 participants), due to challenges with the app's development we have not had the opportunity to have an event solely focused on promoting it. An event such as this will allow us to demonstrate the app's usefulness and provide instruction for the proper use of it; although the app is relatively intuitive to learn by ones' self, this opportunity provides us the chance to explain its environmental benefits. After this, we will be able to consistently analyze trends in the data, which will allow us to facilitate meetings with stakeholders to address any potentially identified issues.

Our next priorities will be to both acquire funding for the future maintenance and marketing of the app as well as promote it to a wider range of audiences, specifically with the world network of biosphere reserves. The actions required to address these two priorities will be included in MABRRI's updated Strategic Action Plan, due to be released early on in 2018. The actions will include developing a long-term contingency fund as well as sharing the development, results, successes, and challenges of this project with other regions, such as other biosphere reserves in Canada, the USA, and Mexico..

For more information about the project please contact:

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