

CARL Research in Librarianship Grant 2013

Final Report

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Rationale

Virtually every academic discipline has a field research component. This is often where most of the raw data is collected; however researchers who rely on IT infrastructure and academic support services on campus are, quite literally, left to their own devices when they are doing field research.

Many researchers collect data in the field on paper and then transcribe the data into machine-readable form. This double-entry is time consuming, expensive and error prone. Collecting the data on mobile devices at the outset can create great efficiencies and more cost-effective use of research dollars. The library has a key role to play in facilitating this transformation of field research.

What are the challenges faced by researchers in the field in the collection and management of data? What are the challenges and opportunities of using mobile technologies in remote locations? How can an academic research library support those researchers in the field? How does this fit within the broader context of the library's data curation objectives?

Methodology

Literature review

I have conducted a review of the literature focused on the following themes:

- protecting your device (physical damage, theft and loss, identity protection, data on the device)
- data collection (mobile apps, web forms, SMS)
- storing data safely and securely while in transit
- specialist devices
- data access using mobile devices

Technology review

I acquired mobile devices and software for testing and developing potential tools and strategies for use in the field. I also tested a number of platforms such as develop-and-deploy mobile app platforms.

Interviews with researchers

I conducted twenty-five interviews with researchers from disciplines as diverse as geography, biology, environmental design and rural development, plant agriculture, environmental science, political science, anthropology, and population medicine. These researchers bring perspectives from field research conducted in Ontario, northern Manitoba, Viet Nam,

Bangladesh and South America. Some of these researchers are self-confessed technophobes while others are quite sophisticated in their use of technology.

Knowledge base

One of the core products of this research project is a knowledge base of devices, software, platforms, and best practices which could be an invaluable resource for libraries interesting in supporting field research. I created the KB as a Wiki to permit crowd-sourcing, enabling a community of interest to identify and assess emerging technologies.

Book chapter

I have submitted a proposal for a chapter to be included in a book titled *Mobile Apps for Academic Library Research and Scholarly Work*.

Interviews

Twenty-five researchers were interviewed from the following disciplines: geography; biology; environmental design and rural development; plant agriculture; environmental science; political science; anthropology; population medicine.

The interviews covered the following areas: field environment; data collection practices; data storage; use of mobile devices; data management upon return.

Many researchers were capturing their data on paper and later transcribing to a computer. This entails the expense and delay of double data entry, errors introduced during the transcription process, and vulnerability of data that exists only in paper form until it has been transcribed. One researcher reported a case where all of his data was on paper which he kept in a truck but then the truck was stolen.

Researchers expressed interest in the additional capabilities that would be possible with mobile technology including: photos; GPS coordinates; linkages between numeric data, photos, samples, etc.; controls on values (e.g. authority files); improved data quality.

There was quite a bit of concern about secure storage of data including audio recordings, video recordings and survey data.

Some researchers also expressed concern about data collected in adverse conditions (e.g. on a body of water) and about the risk of theft in certain environments.

Bolivia

An essential part of my research involved an exploration of the challenges of using mobile technologies in developing countries. The grant enabled me to travel to Bolivia to work with a number of organizations in several different cities.

Centro de Generación de Información Estadística (CEGIE)
Primary contact: Carlos Foronda



CEGIE is a unit with the Universidad Privada Boliviana. It was created with the objective of managing statistical and cartographic information for economic and social research.

CEGIE had just concluded a major household survey throughout poorer regions of Bolivia. They had surveyed 4,000 to 5,000 households which resulted in five tons of paper that had to be transcribed and stored. They were very keen to move to digital data collection for projects of this nature.

"Te cuento que hace dos semanas hicimos una encuesta en teléfonos Android con el app que nos mostraste. Encuestamos a 500 personas con una encuesta de 30 preguntas, nos fue muy bien, ahora pensamos emplear este sistema en otros trabajos más complicados. Gracias por tu ayuda, saludos." (Carlos Foronda, 19 May 2014)

PROINPA

Primary contact: Ana Karina



Fundacion PROINPA is an agricultural NGO dedicated to research and technological innovation. Ana Karina Saavedra Rivera is a researcher with PROINPA working with potatoes and tarwi (a species of lupin with an edible bean). Her particular focus is soil health. She has plots at various altitudes that have been treated with different fertilizers.

Ana Karina has been gathering data from her crops on paper. The data includes height and yield. The paper forms are vulnerable to rainy weather and must be transcribed into spreadsheets. She also uses different forms for different data elements meaning that height data cannot be correlated with yield data.

She also takes photographs of plants. These photos are transferred to her laptop but she has no long-term storage solution.

There is usually internet access in the field but not always. Not all researchers and technicians have devices.

I spent a couple of hours developing an app for Ana Karina's smartphone. She seemed quite elated to be able to use the app and discontinue use of the paper forms. The app incorporates GPS coordinates and the option to include photographs.

I have not heard from Ana Karina since returning to Canada.

Centro de Promocion Agropecuaria Campesina (CEPAC)
Primary contact: Widen Abastoflor



CEPAC's mission statement: "Somos una organización con fuertes valores y capacidad técnica, dispuesta a vivir nuevos paradigmas. Brindamos servicios innovadores con enfoque de género, respeto y compromiso social en desarrollo económico social sostenible, promovemos el ejercicio de los derechos individuales y colectivos, contribuyendo al bienestar de familias, organizaciones sociales y del estado."

The researchers I met with do work in a range of areas including honey production. They all administer surveys and there was interest in moving to mobile technologies as replacement for paper surveys.

The staff member who was going to provide translation services had car trouble and did not show up which means the entire meeting was conducted in Spanish. This created some unfortunate challenges to the discussion.

Widen wanted me to develop a formal training program and return to work with his researchers in the fall.

He sent the message below as a response to the meeting we had.

"Estimado Wayne.

"A pesar de las dificultades lingüísticas, la experiencia ha sido bien recibida por CEPAC y por las organizaciones socias de nuestros proyectos.

"Mantenemos las expectativas de empezar a aplicar esta innovación tecnológica que seguro va a facilitar nuestra trabajo, ya te estaremos comentando los avances y también las consultas que vayan surgiendo.

"Gracias por compartir los correos de los técnicos de otras instituciones, creo que va a ser posible intercambiar nuestras experiencias y limitaciones para ayudarnos mutuamente.

"Hasta una próxima oportunidad.

"Buen Viaje."

UG research projects

Roaming dogs in Mexico

Primary contact: Luz Kiziel



This research project involves a team of about thirty researchers documenting street dogs via photographs and GPS coordinates using mobile devices.

Discovering Biodiversity

Primary contact: Aron Fazekas



I partnered with a third-year class called Discovering Biodiversity. About 2,000 students enrolled in the class are divided into groups of four. Each group is assigned to a plot of land in a forest where they have to identify the trees contained in that plot. The data collected is then used for analysis throughout the semester.

The class had been collecting the data on paper. Graduate students would then have to transcribe all of the data into spreadsheets where it could be prepared for analysis. This process was expensive, time consuming and error prone. We introduced data collection using mobile technology with the result that more reliable data was available for analysis almost immediately. We worked through several iterations of a data collection instrument before we settled on one that was most effective.

Wiki knowledge base

I have established a Wiki knowledgebase with about 100 pages covering tools and best practices. This site will be open to input from users to ensure that it continues to grow and be maintained beyond the period of my research project.

The wiki site is available at this URL:
https://fieldresearch.miraheze.org/wiki/Main_Page

Conclusion

Considering that almost all academic research features some form of field research activity, the wide range of data collected, and the fact that some projects are funded for technology while others have no funding at all, it is clear that we need a wide range of options to accommodate all needs in an optimal manner. The challenge is to understand the tools and resources available and navigate to the one solution that best meets the needs of an individual project. It is hoped that the Wiki Knowledge base established by this project will be a key resource in meeting that objective.

Conference presentations

"Library support to researchers in the field." 2013 LITA Forum: Creation, Collaboration, Community. Louisville, Kentucky. November 7-10 2013.

"Mobile technologies to support field research." CNI Membership Meeting Fall 2013. Washington, DC. December 9-10 2013.

"Mobile technology support for field research." Digital Scholarship Colloquium 2014: Pedagogy and Practices. Case Western Reserve University. November 6-7 2014.

"Mobile technology support for field research." CNI Membership Meeting Spring 2015. Seattle, WA. April 13-14 2015.

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