CHAPTER 9*

From Start to Finish

Mobile Tools to Assist Librarian Researchers

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Introduction

Mobile apps are a pervasive part of daily life. Well over 100 billion apps have been downloaded since 2009, and there are over one million apps that are available to anyone with a mobile device. While librarians frequently use mobile devices and apps for their professional practice, reference, and teaching, the growing ubiquity and utility of these tools strongly suggest their potential for use in another area of academic life: conducting original research. This aligns perfectly with the growing recognition of librarians as researchers themselves, and the associated requirement by more and more academic institutions that librarians perform research as part of their job description. This chapter focuses on the stages of the research process, including project conception, preparation, start-up, data collection and sampling, data analysis, dissemination, and data storage. The best apps (or mobile websites) available to assist librarians as they complete these steps will be reviewed. Factors considered will be usability, design, features, cost, and privacy concerns. This chapter goes beyond commonly recommended productivity tools such as Dropbox or Evernote and will highlight apps that can assist librarian-researchers in the completion of an entire research project from start to finish. A variety of apps are explored, including those designed specifically for the educational market, those created for broad social science research, and those intended for commercial market use.

A History of Apps

Mobile applications, or apps, have been around almost as long as the first mobile devices. Beginning with PDAs and progressing through iPods, apps were initially preloaded on a device and limited to games like Snake or Solitaire or basic tools such as calculators or calendars. The launch of the iPhone in 2007, and the announcement that outside developers could develop apps for it, changed everything. When the Apple App Store launched in July 2008, it had 552 apps, of which 135 were free (Strain, 2015 (Feb 13)). Within a single week, ten million apps had been downloaded (Cohen, 2008 (July 14)); within sixty days, 100 million apps had been downloaded, and over 3,000 apps were available (Cohen, 2008 (Sept 9)). Between 2008 and 2010, Google Android Market, BlackBerry World, and Windows Phone Store all launched—opening up new markets for app developers (Strain, 2015 (Feb 13)). In 2010, *app* was voted word of the year by the American Dialect Society (American Dialect Society, 2010). By 2013, there were over one million apps in the App Store, with sales topping $10 billion USD (Apple, 2013; Ingraham, 2013 (Oct. 22)). By its sixth anniversary in 2014, the App Store hit 75 billion downloads (Dilger, 2014 (July 10)). In 2015, it was estimated that Google Play (formerly Android Market) had twice as many downloads as the App Store—over 200 million during the year (Woods, 2016 (Jan 20)).

All of the preceding illustrates the fact that apps have become a part of our day-to-day life and a primary way that most users interact with content on their mobile devices. The types of apps vary widely. Games are by far the most popular category of apps downloaded from the App Store (22.99% of all downloads) (Statista, 2016). Apps that are potentially more relevant to librarians include those found under Education (9.26%), Productivity (2.77%), and Reference (2.24%) (Statista, 2016). There are now apps available that can compete with many of the traditional tools that librarians might use to complete their research.

The Librarian as Researcher

The concept of librarians as researchers is one that has been growing steadily over the last decade. The American Library Association (ALA) and the Canadian Association of Research Libraries (CARL) both identify research as a core competency for librarians (American Library Association, 2009; Canadian Association of Research Libraries, 2010). Within the literature, the topic of librarians as researchers, as well as the barriers, challenges, and research supports offered to librarians, have been explored in depth (Berg, Jacobs, & Cornwall, 2013; Hall & McBain, 2014; Kennedy & Brancolini, 2011; Koufogiannakis & Crumley, 2006; Powell, Baker, & Mika, 2002; Watson-Boone, 2000).

Within Canada, the development of the librarian-as-researcher culture has been aided in no small part by the creation of several organizations and institutes aimed at supporting these librarians. In 2012, CARL launched its Librarians' Research Institute to serve as a place for librarians to develop their research skills, work on their research in an intensive setting, be given mentorship, and engage in networking opportunities (Canadian Association of Research Libraries, 2016). As a result of its success, similar programs were started at both McGill University and Concordia University (Carson, Colosimo, Lake, & McMillan, 2014). In addition, the Centre for Evidence Based Library and Information Practice at the University of Saskatchewan was launched in 2013 as a resource to support librarians as researchers. While it was focused primarily on supporting U of S librarians, its annual symposium, resource pages, and blog are extremely helpful to all librarians working on research (C-EBLIP, 2016).

The level of discussion in the literature, the inclusion of research as a core competency, and the creation of institutes and workshops all clearly demonstrate that research is a vital and essential part of an academic librarian's professional practice and is required for career advancement via promotion or tenure.

Mobile Tools and the Researcher

Whether as part of their research or simply as part of their daily professional practice, librarians must constantly seek to stay on top of trends when it comes to information technology, scholarly communication practices, and ways of sharing information. This is particularly true in academic libraries, which have a constant turnover of new students and a strong focus on research programs and scholarly output. As a result, academic librarians must constantly adapt to the changing technological preferences and information-seeking behavior of our patrons.

As has been shown, our patrons increasingly exist and interact in a mobile environment. In order to stay current, we must follow suit. While work on the use of apps in research is limited, and discussed below, there has been some work on how researchers use Web 2.0 tools (nearly all of which are available in mobile form). In a work published in 2009, Kalb, Bukvova, and Schoop explored the research process and the role that social software, such as wikis, microblogging, and social bookmarking, play. They outlined five activities in the individual research process that can benefit from social software: exploration, retrieval, reading, writing, and dissemination, and linked specific tools that can enhance or support these activities. Other studies have explored how academics use Web 2.0 tools in their scholarly work, including research. The majority of the findings indicate that while Web 2.0 tools are being used by researchers in limited numbers, they are not necessarily being used during the complete research process. Instead, these tools are being used in only very specific areas, such as managing citations (e.g., Mendeley, CiteULike, and Zotero) and scholarly communication (e.g., Twitter) (Al-Aufi &

Fulton, 2015; Calvi & Cassella, 2013; Haustein, Bowman, Holmberg, Peters, & Larivière, 2014; Procter, Williams, & Stewart, 2010).

In general, librarians seem much more familiar with Web 2.0 tools than their professorial counterparts, in part due to the ease with which these tools can be incorporated into library programming and reference. In regard to mobile devices and apps, librarians do use them for their professional practice and teaching (Aiyegbayo, 2015; Duncan, Kumaran, Lê, & Murphy, 2013; Smith, Jacobs, & Lippincott, 2010). However, the growing ubiquity and utility of these tools strongly suggest their potential for use in another area of scholarly work, namely research. This is an area where librarians could take the lead, as it is clear very little work has been done on the use of apps to aid in the research process.

Most research that discusses apps focuses on the evaluation of an app for a specific purpose, such as apps for smoking cessation, apps to help consumers monitor tick bites, or apps to measure vertical jump performance (Bricker et al., 2014). While various lists of "must-have" apps abound, they tend to usually be quite wide-ranging in nature (including apps for both personal and professional life). Hennig and Hennig and Nicholas have done excellent work at highlighting apps for use by academics and librarians (Hennig & Nicholas, 2014; Hennig, 2014a). Both works have taken a broader view and included whole chapters on apps for productivity, reading, and note-taking. While both titles do include chapters on research, they do not focus on the research process per se (e.g., data collection, sampling). It is hoped that this chapter will further expand our knowledge of the use of apps by librarian researchers and that its findings will be applicable to all researchers.

Why You Should Use Apps for Research

It is likely inevitable that one may ask oneself *why* a librarian would want to use mobile tools to conduct research. Why would you want to use a small screen with limited typing capability to complete massive research projects when you could just use a laptop? There are several key reasons worth highlighting:

1. Always Available—The amount of research being published these days is increasing exponentially. Librarians conducting research or on the tenure track will be all too familiar with the publish-or-perish pressure. In some cases, it may become the defining feature of one's workday. As such is the case, why not attempt to conduct research using the device that goes with us everywhere at all times? If you think of an interesting idea late at night, you can simply record an audio note. Perhaps you come across an interesting book in the bookstore and want to see whether the library has it. Now you can pull up the mobile-friendly catalog to check.
2. One Device—Depending on the type of research being done, researchers may need survey instrumentation, cameras, notebooks, recording

devices, transcription services, word processing software, and so on. Instead of having multiple devices of which each performs a single function, the use of a mobile device and the use of apps means that one single device can be used to accomplish all these tasks.

3. Apps ≠ Phones—While the inclination may be to link the use of apps with the use of a smartphone, this is not necessarily the case. Apps can be used on desktops, but more importantly they are also available on tablets, such as the iPad and Surface. Tablets now come with keyboards and styluses and are able to give users the convenience of a mobile device with the power and ease of a laptop or desktop computer.

The Research Process

While the research process as written about in handbooks and methodological frameworks is often portrayed as a constant iterative loop, for the purposes of this chapter more practicality is required in order to see a researcher move through all (or most) of the stages of research to successfully complete a project. As a result, this chapter will deal less with theory-based design and more on a progression of steps that includes the very necessary (but less discussed in handbooks) stages of research, including writing, creation of figures, and dissemination.

Evaluation of Mobile Apps

With over a million apps available to consumers, it can be difficult to determine which apps are actually any good. Within the field of education, several rubrics have been developed to evaluate the quality of an app, with a specific focus on their use in the classroom (Walker, 2010). Hennig (2014b) provides a checklist for librarians writing app reviews. This is an extremely comprehensive list that is a bit too in-depth for the purposes of this chapter. Instead, key factors from the checklist are considered, including

- Currency—Updates from 2015 or 2016 were preferred; many apps that were initially considered stopped updating in 2012 or 2013.
- Cost—While free, freemium, or low-cost apps were preferred, there are some instances where more expensive apps were the only or best option available.
- Platform—Apps or tools available on iOS and Android were preferred, but this was not always possible.
- Syncing—Ability to sync across devices is nearly a standard requirement.
- Accessibility—Apps must have been available for download by both Canadian and US researchers.

- Importing and Exporting Options—The ability to pull in data or information from other sources and then transfer that information elsewhere as needed is extremely important.
- Design—Apps that were visually appealing and intuitive to use were preferred.

It is also worth noting that apps are discussed in the context of the activity that is seen as their primary purpose. In other words, while an app such as Dropbox may be mentioned as a tool for archiving, it would nonetheless also work for collaboration and writing. Finally, in almost all cases there is no pricing information or website information listed. While the author was conducting research for this chapter, it became clear that app prices, features, and even their availability can change very rapidly. Rather than including detailed charts or tables with this information that would become outdated by the time this chapter is published, librarians are encouraged to use their very best Googling skills to find the most up-to-date information on the apps they are interested in pursuing.

Mobile Apps for Research

Project Conception and Design

MIND MAPPING

While some researchers prefer to begin research projects by writing all their ideas down, others will want to create mind maps as a way to visually organize their information. There are many expensive, although very well-designed, apps available for power users. For those looking for cheaper options, however, the author found the best app to be Coggle, a free web-based application that allows for collaborative mind mapping using one's own design or uploaded images. Maps are easily exportable and can be embedded into other locations very easily. SimpleMind has a free app that allows you to create maps on the go. Syncing to other devices has a cost, and functionality is often somewhat limited. The Total Recall app allows you to create up to three free maps of unlimited sizes and with an array of colors and images to use. For those willing to pay, MindNode and Popplet are two of the best-designed tools in the lower price range.

NOTE-TAKING

Note-taking is one of the areas in which app users are spoiled for choice. The perennial favorite, Evernote, allows for note-taking to be taken to the extreme. (Users can upload notes via audio, scanning via its Scannable tool, by taking a picture of handwritten notes on its specialized Moleskin notebooks, or even by plain old typing). Evernote notes can be accompanied by checklists and photos and can

sync across devices. OneNote also seems very popular, even for those who do not regularly use Microsoft Office. It allows one to take notes, make to-do lists, and create project folders, and it comes with a large range of formatting options. Audio, sketches, and video can be included, and it can be synced across devices. The Google Keep app, which has the appearance of a sticky note, allows one to create notes with checklists and images, write up longer documents, and also to sync across devices. The app has an audio feature that will transcribe any voice note that one records and make it into a note right away. It also fully interacts with the entire suite of Google Drive products. For those who like an extremely simple interface, Simplenote offers a straightforward design and the ability to collaborate on notes and to search through one's whole note history to find something that may have been deleted. For researchers who prefer to dictate their shorter research notes or thoughts, Dragon Dictation allows one to create short audio messages that are immediately transcribed to text and saved.

BACKGROUND RESEARCH

As librarians know very well, any type of research will require a visit (either in person or electronically) to the library. Most libraries now have mobile-friendly or specifically designed apps to search their OPACs. The list of vendor-supplied apps that search only within their products is extensive. Some notable examples include OvidToday, which allows for full-text access (via your library subscriptions) to all Ovid journals via its app. JSTOR's app lets you search its holdings, access full text, and pull out citations. Within the humanities and social sciences, EBSCOhost's and ProQuest's apps both allow one to search through their databases and access the full text. If your library's institutional holdings include them, EBSCOhost includes access to Library, Information Science and Technology Abstract (LISTA) and Library and Information Science Source (LISS), while ProQuest provides access to Library and Information Science Abstracts (LISA). Combined, these three databases make up the major sources of library science research.

KEEPING CURRENT

Keeping current with the literature is an area of importance for all researchers. BrowZine is free to the user and available at many institutions. The users simply select the journals that are of interest to them, link to their institutions' own holdings for full text, and then are notified whenever a new issue is released. Researchers can then annotate articles of interest to them and export them, either as a PDF or to a citation management program. For those librarians conducting research in the health sciences, Read by QxMD, Docphin, and DocWise are also available.

DATA MANAGEMENT PLANS

The completion of a data management plan is becoming a best practice for those completing research for which large amounts of data will be created. Unfortunately, data management is an area for which there is not yet strong support via either app or mobile-friendly sites. Instead, sites that help researchers create data management plans, such as DMP Assistant (Canada), DMPonline (UK), or DMPTool (US), have to be accessed via regular websites and are not necessarily optimized for smaller devices. On larger tablets, however, the tools are often straightforward to use.

Project Start-Up

MEETINGS WITH COLLABORATORS

If you are working as part of a team, or just need to meet with an interviewee in another location, there are free apps available for meeting online—although not all of them have the full capability of their browser-based product counterparts. join.me is one of the better free apps for online meetings as it allows for video, audio, whiteboard, annotations, and document and screen sharing from within the app with up to ten people. VSee lets you talk with up to five people while sharing your screen using very secure technology, while Google Hangouts enables you to video chat with up to ten people. Both VSee and Hangouts let you share documents and your screen only when the meeting organizer is using a desktop version. Unfortunately, one of the other well-designed products, TeamViewer, has the same problem. TeamViewer is a robust tool and has a free app for joining meetings. The initial meeting, however, must be created using the desktop or web version. In addition, the organizer must be on a computer in order to share documents.

PROJECT MANAGEMENT

Researchers, whether working on a small team or alone, may find it difficult to keep track of all of the different tasks that must be done in order to complete a given project. There are several tools that provide assistance in the setting of goals, time lines, tasks, and scheduling. Asana, a web and mobile app, allows you to track all aspects of your work, who is involved and responsible for what, time lines, and when items are accomplished. Team members can have conversations within the app that are saved for future reference. The basic version of Asana is free for teams with fewer than fifteen people. Trello is a project management app that uses a card- and boards-based system to manage everything from complex projects to shopping lists, whether on your own or part of a larger research team. Freedcamp is a completely free project management tool that aims to help schools, educators, and small businesses manage their projects. Multiple people can work together;

add milestones, tasks, and scheduling; and have discussions. While it is currently only a web-based program, an iOS app is in the works.

EXPENSES AND BUDGETING

For those librarians who receive research funding, staying on top of expenses can be a task that gets left until the end of the project. However, keeping track of things such as mileage, travel expenses, and software purchasing costs can easily be kept on top of by using apps designed to keep track of business expenses. Smart Receipts is an open-source app that lets you scan receipts with your phone, and it can handle multiple currencies and generate reports that can be e-mailed or exported. The Shoeboxed app allows you to organize receipts, which can be scanned using your phone (the app allows for text recognition), uses your phone's GPS for mileage tracking, archives receipts automatically, and sends expense reports using your scanned receipt images. The free version of this app allows you to include up to five receipts per month. For librarians whose institutions use Concur as their travel management software, the free app Concur for Mobile can be used to track business expenses and receipts manually or, using your phone, to link to business credit card expenses and to submit and approve expense reports. For librarians looking for a more robust budgeting tool, Mint works well in both Canada and the United States, it links with most major financial institutions, and it compiles detailed budgeting information based on your spending habits. The Goodbudget app allows you to allocate expenses to specific "envelopes" to track spending and share the budget with colleagues.

Data Collection and Sampling

RANDOMIZATION

There are several tools available for randomization—whether it is of study participants prior to starting research or simply choosing a random prize winner from among survey participants. Research Randomizer is a free web-based program that is designed for researchers and students to be able to generate random sets of numbers. For librarians who may be part of research teams involving patients, Randomizer for Clinical Trial Lite is a free patient randomizer app that allows you to input patient information and follow randomized patients throughout the study period.

DATA COLLECTION

Surveys

Surveys are another area of strength when it comes to app availability, although finding one that meets all your needs for free may be a challenge. SurveyMonkey,

one of the most widely used survey tools in library research, has an app that allows you to build surveys, collect responses, and analyze results. The free version is limited to ten questions and 100 responses. SurveyLegend is a free tool that works best in the app environment. You can easily create surveys on your device using a range of well-designed templates and a wide variety of question types. Surveys' responses can be analyzed and exported from the app as well. The first three surveys are free, and you get unlimited responses. Unfortunately, Canadian librarians concerned about where their data is housed are no longer able to access FluidSurveys at a reasonable price. The company has been bought by SurveyMonkey, and storing data in Canada now costs $119 USD per month. For researchers comfortable with more basic surveys, Google Forms is an option via the web-based tool. Users get unlimited free surveys and have access to a variety of themes and question types. Results can be easily analyzed and exported.

Interviews and Focus Groups

For librarians conducting interviews or focus groups, there are various tools available depending on what type of information needs to be captured. For written notes taken during an interview, refer to the category Writing below. For in-person audio-only interviews, Pio Smart Recorder is a free tool that lets you mark during a recording when something particularly important was noted. Voice Record Pro has an easy-to-use interface and allows for basic editing within the app. AudioNote Lite lets you make audio recordings and then attaches written notes to specific points with the recording—a great feature for noting particular areas of importance. QuickVoice Recorder is a free voice recorder app that allows you to switch between the app and other applications while recording. This is especially useful if you want to make notes or look up additional questions while an interview is being recorded. If the interview is being done over the phone, a fairly inexpensive option is TapeACall Pro, which allows you to record incoming and outgoing calls. Calls are secure and can be shared among colleagues. If the interview is to be captured using video, almost all smartphones and tablets have a built-in camera that allows for the capturing of video. The length of the recording will vary based on the phone and the storage capabilities, but recordings of thirty to sixty minutes should not be a problem. Researchers looking for a higher-quality video recording app with more functionality may have to be willing to spend a bit more money. The Camera Plus Pro app captures video and images, allows for editing within the app, and lets you choose the image resolution.

While there are a large number of resources that help researchers run focus groups or conduct market research, many of them, such as Upinion or Liveminds, are prohibitively expensive for most researchers. However, FocusGroupIt is a web-based tool that is simple to use, and the free account offers you one active focus group with up to ten participants.

Transcription

The transcribing of interview recordings is a time-consuming and onerous task. While no app is yet available that offers free and reliable long-form transcription, there are several that offer starting points. Dragon Dictation is one of the most popular transcription apps but focuses mostly on transcribing audio to text for things like e-mail, texting, or updating a status. While fairly accurate and free, it deals only with live recordings. TranscribeMe allows you to record within the app or import from other sources and offers a claimed 98 to100 percent accuracy rate for $1.49 USD per minute. Apps like Dictamus and Philips Dictation allow you to make secure recordings but require you to have access to a more robust transcription program on your computer.

Data Analysis

Data analysis is one area to which app developers need to devote more attention. Likely due to the fact that data analysis software programs, such as NVivo or SPSS, are often very expensive and complex tools, there are no great low-price apps or mobile-friendly sites available yet. However, since the bulk of librarian research does not produce massive amounts of data (in comparison to, say, medicine or psychology), less robust tools may be acceptable. One such tool is Dedoose, which is a web-based program begun by academics that is specifically designed for mixed-methods and qualitative data analysis. Pricing is based on a monthly model, and it is designed to be particularly intuitive to use. It allows for multiple research team members to work on the same set of information (although individual access privileges can be set for each team member) and is particularly strong when it comes to collaborative features. This app could be particularly helpful for multi-institution librarian research teams. Researchers performing statistical analysis can use StatsMate—an iOS-only statistics calculator that can generate descriptive statistics; conduct hypothesis tests; and provide correlations, simple regression, and one-factor and randomized block ANOVA models (Lomax, 2013). In a study on statistical accuracy, when compared to other apps such as Data Explorer, Statistics Visualizer, and TC-Stats, StatsMate was found to be the most statistically accurate and comparable to Excel 97 (Lomax, 2013).

Writing and Citing

SCANNING

Whether researching at an off-site location or working out of a foreign library, researchers may encounter the need to scan documents. While previously one would need access to a stand-alone scanner or photocopier for this purpose, there are now apps designed to take a picture of a document, image correct it, and con-

vert the image to a PDF. Genius Scan is a free mobile app that easily scans documents or receipts and converts to a specific format, which can then be e-mailed, archived, or exported (this comes at a cost). The Google Drive app for Android also allows for scanning and direct uploading to Drive and has basic text recognition. For people already using Evernote, the add-on app Scannable quickly scans and edits documents, business cards (which it can translate into LinkedIn contacts), receipts, and more. Other notable free scanning apps include CamScanner and CamBot.

WRITING

One activity for which there are a multitude of high-quality apps for a low price is writing or note-taking. Google and its entire suite of tools (Docs, Sheets, Slides), available via web and mobile app, are extremely robust, sync easily to the cloud via Google Drive, and offer nearly the same number of features as traditional programs like Microsoft Word. In fact, this entire chapter was researched, written, and revised using Google Docs and Google Drive. In 2013, Apple began offerings Pages, Numbers, and Keynote to users who upgraded or purchased a mobile device running iOS 8. This elegant suite of tools, which was designed first as a mobile-only collection, allows you to create documents, edit, add formatting, and easily save to the cloud. While Microsoft has made its Office tools available via an app, a subscription is required in order to create new documents, provide major revisions, or use rich formatting. For those wanting to edit Office documents, Citrix ShareFile, QuickEdit, and WPS Office are all free apps that allows for creating, viewing, and editing documents. There are numerous other paid apps worth exploring, including Textilus and iA Writer.

MANAGING PDFS

Mendeley is one of the most popular apps for managing PDFs. With free account creation, Mendeley can be synced across devices, gives 2 GB of free online storage, and lets you annotate and make notes. When linked with the web or desktop version, Mendeley becomes a powerful citation and bibliography tool as well. Qiqqa (Android only) is another popular tool that lets you manage PDFs, create annotation reports of all the notes you have made across multiple documents, and guides you through your literature based on identified themes. PDF Expert 5 (iOS only) lets you manage your PDFs, create freehand drawings and annotations, and even merge PDFs and manage pages within a PDF.

CREATING BIBLIOGRAPHIES

Several well-known citation tools, such as Papers and EndNote, offer free apps but require a subscription to a desktop version in order to access or use content and do

not contain integrated writing apps to create in-app citations. Instead, citations will mostly occur by using the copy-and-paste method. Most of the free citation apps are designed more with students in mind and are best for citing a few documents or websites in a single paper. For example, the free version of the EasyBib app is a citation generator that has over 7,000 citation styles available. Citations can be pulled from websites or by scanning the barcode of a book, and there are fifty-nine different publication formats supported (websites, books, articles, etc.). EasyBib, however, is not intuitive and gets cumbersome when one is dealing with more than a few references. BibMe and Citation Machine work much the same way, except for the barcode-scanning ability. By far the best free tool is for citation management is RefME. Although it does have a web interface, the app allows you to quickly search for citations in journals, books and websites or by scanning barcodes. It easily creates bibliographies that can be exported in a number of ways in over 7,500 citation styles.

Data Visualization

Turning research data into a visual representation is a way to convey information in an entirely new way. Depending on the type of visuals required, there are multiple apps available. In order to move away from standard Excel pie charts, there are a host of tools that allow for the creation of beautiful charts, graphs, and infographics. Visme, Genial.ly, and Easel.ly all have basic models that allow for presentation, poster, and infographic creation. For those with some grant funding, Infogr.am is a monthly subscription–based web app that allows one to upload data sets, which it then uses to create interactive and custom infographics using hundreds of templates. ChartBlocks is a web-based app that allows for the creation of thirty free charts. You can copy and paste data or enter it manually and have the choice of five different chart types. The charts themselves are highly customizable in terms of color; can be downloaded as PS, SVG, and PNG files; and can be embedded into presentations or reports.

Publishers usually require at least 300 dpi for images to be included in publication and typically prefer image files in TIFF, EPS, or PDF format. To convert an image to a different dpi, researchers can use the web app Convert Town or download the free app for the open-source imaging software GIMP. To convert a file type to TIFF, there are numerous web-based products, including ConvertImage, Zamzar, and Sciweavers.

Publication and Dissemination

DESIGNING PRESENTATIONS

There are also a multitude of tools available for the creation of presentations us-

ing a mobile device. In terms of presentations, Google Slides is free, syncs with the Google Drive suite, and offers fairly robust formatting features as well as the ability to share presentations via URL and to present online. While the desktop version is more robust, Prezi Lite Editor is a free app that allows for the creation, editing, and online viewing of immersive presentations with a fairly wide array of themes. For librarians with a bit of funding or who have purchased an iPad recently, Keynote is popular with iOS users. It is very easy to use on a mobile device and allows for the creation and editing of visually appealing presentations using a large number of available templates. When presenting, Keynote has airplay support, which allows the presentation to be playing on the display device but for the notes and movement functions to be visible to the presenter on his or her device. For those researchers who have visual-heavy presentations, Haiku Deck is a great option. It requires a $5 USD monthly fee but has several nice features, including the ability to use your smartphone as the remote for controlling the presentation and access to a large collection of stock images and templates.

CONFERENCE CALLS FOR PAPERS

Keeping track of calls for papers from conferences can be overwhelming. The low-cost Call For Papers pulls data from WikiCFP—which currently has one hundred CFPs in information science, sixty-four in digital libraries, and ninety-three in health informatics. Users select a favorites list that allows them to be notified when there are new calls in their area of research.

SOCIAL MEDIA

As mentioned above, social media is one of the tools researchers already use in their research process. Twitter allows librarians to build up followers from around the world who are interested in the same research topics and then to tweet out new research projects or publications. Academia.edu is a social networking site for academics where researchers can post their CVs, upload preprints or other copies of their research, and connect with potential collaborators. The free app is not as robust as the website. However, it serves all basic functions.

METRICS

Keeping on top of author- and article-level metrics is an important task for any researcher. In terms of alternative metrics, using the mobile-friendly site Impactstory, you can link your ORCID profile and will be provided with an in-depth analysis of your work, including mentions in Twitter, Facebook, Google+, and the news and information on your readability and global reach. For traditional metrics, accessing the mobile-friendly site Google Scholar and creating an online profile will allow you to view your *h*-index, i10-index, and citation counts.

Archiving

There are several aspects of archiving that must be considered when discussing apps. The archiving and potential sharing of research data, particularly data from projects that were publically funded, is frequently a funding requirement. Unfortunately, there are no great options when it comes to data sharing and archiving that are available via app or mobile-friendly sites—likely the result of the large and numerous files and the often complex requirements involved in data archiving. Researchers will have to use standard websites and programs based on their geographic location, potential institutional programs, and funding requirements (if received) for the archiving of data.

In terms of the archiving of research papers or supplementary material, there are options depending on the type of material that needs to be archived. Dropbox and Google Drive both allow for uploading of documents and other file types, and researchers can publicly or privately share or post links to the material as they see fit. Many academic organizations also allow for the uploading of documents to institutional repositories (e.g., DSpace)—which unfortunately are not usually mobile-friendly. However, depending on institutional or granting agency requirements regarding access to data, as well as confidentiality and privacy concerns, researchers are advised to proceed with caution and consult local policies. Research data may need to be anonymized, and depending on the data management plan in place, there may be requirements surrounding retention and destruction. Data management is a rapidly emerging field within academia, and as yet there are no well-designed mobile-friendly products in place.

Apps in Action

As mentioned above, there has been little work done on the use of apps to complete research, whether in the field of librarianship or elsewhere. Instead, the use of these tools is often "hidden" in the research process, such as the matter-of-fact way that collaborators will create a shared Google Drive folder or an Evernote notebook. It is usually only the apps or tools that are used in the completion of the Methods sections of papers that are highlighted simply because the authors must describe in detail how they completed the research. In some cases, the use of apps has become the norm—such as in the case of survey tools. SurveyMonkey, FluidSurveys, and Google Forms have become ubiquitous in librarianship—a field that loves a good survey. A quick scan through recent library research that used surveys will likely reveal that at least one of these tools was used. Other tools, such as Research Randomizer, do make appearances, particularly in health sciences research (Bothung, Fischer, Schiffer, Springer, & Wolfart, 2015; Orak et al., 2016). QuickVoice Recorder has been used in a number of studies, including one

that looks at voice memory tasks (Lee, Sullivan, & Schneiders, 2015). Ultimately, however, the use of apps to complete research is not something that is frequently shared in the literature, just as most authors would not indicate that they used Microsoft Word to draft the text or Gmail to e-mail it to colleagues. If mobile apps and tools are going to continue to increase in popularity among library researchers, it seems likely that the sharing of these tools will have to occur largely through word-of-mouth and shared experiences. Knowing which of the millions of available apps is the one app that can help you to complete your research can save you untold amounts of time.

Conclusion and Future Directions

This chapter has been an exploration of the mobile apps and tools that can help a librarian researcher complete a research project from start to finish. While some steps will be easier to complete on a mobile device, all the steps are, in fact, possible. As librarians have moved away from the stereotype of being hunched over card catalogs, so too must we move away from the idea that we must hunch over our desktop computers to perform our research. Mobile technology gives us the freedom to use a single device to conduct our research wherever suits us best—whether that is up in the stacks, out in public study areas, as part of clinical rounds, or embedded in the classroom. While the apps discussed here are up-to-date as of the spring of 2016, no doubt changes will occur as new tools appear and old ones disappear, and we will once again have to familiarize ourselves with new technologies. Keeping abreast of how our faculty members and students interact with one another and complete their own research will be an ongoing advantage in remaining vital to our communities and our institutions.

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