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Web vs. Native Applications: Best Practices and Considerations in the Development and Design of Web Applications

Introduction

Mobile access is in greater demand than ever by library patrons in today's modern world. Smartphones and other mobile devices are becoming the preferred way to access information including resources and services from libraries. As user expectations for mobile services increase, libraries have an exciting opportunity to engage their users in new and dynamic ways. Providing mobile services allows libraries to stay ahead of the curve and stay relevant in an ever growing mobile society. A common debate amongst libraries that are building mobile applications is whether to build a native or web application for their community (Nowlan, 2013). This paper will look at the differences between native and web applications and look at some of the best practices for building web applications.

About the University of Regina

The University of Regina's main campus is located in the capital city of Regina, Saskatchewan, Canada. Enrollment is more than 14,200 full-time and part-time students and there are more than 2,200 teaching staff. The University of Regina currently has 10 faculties and 25 academic departments with programs leading to bachelor's, master's, and doctoral degrees. The University of Regina also works closely with its three federated colleges: First Nations University of Canada, Campion College, and Luther College. The Dr. John Archer Library is the main library at the University of Regina.

Making our Library Mobile Friendly

In 2011 the University of Regina Library set a goal of implementing mobile services within the next year. The first plan of action was to create a working group. The Mobile Applications Working Group comprised of four Library staff who had a keen interest in the area of mobile technologies. The group's mandate was to explore the various options for creating a more mobile friendly environment for the University community. Our strategy was to create a survey that would indentify whether a web or native application would best fit our university population.

Mobile Survey

The University of Regina Library conducted a mobile survey which was run between March 15th, 2011 and April 30th, 2011. This survey was open to all students enrolled at the University. Its purpose was to discover how students were currently using their mobile devices and how they might like to use them to access library's resources and services. A total of 628

participated in the survey which consisted of questions that included what devices students were using, which devices they planned on using in the future, what services they wanted to have access to via mobile. One of the most helpful questions was what type of phone students planned on purchasing in the future. Since the world of mobile technologies changes so quickly it was important for us to have an idea of where things would be going in the near future.

The majority of 628 students who answered the survey at the time indicated they had a Blackberry phone, but were planning to purchase an iPhone in the near future. Students always wanted to see services like the catalogue, hours, contact information, and help in a mobile friendly version.

Native vs Web Applications

Now that we had survey data we had to decide whether a native or web application would best suit our population at the University of Regina. The major features of each application are listed below:

Native applications are small bits of software that live on the mobile device and can be installed from the devices store (for example, App Store, Google Play) for free or for a specified cost. These apps are developed for one specific platform. An individual app would need to be created for iPhone, Android, Windows, etc if this type of app was choosen. This makes it difficult for the mobile service to be inclusive for everyone, unless your library is willing to build multiple native applications for each type of device currently available. Because native applications are built specifically for each device they contain specialized gestures and notifications built for the smart phone it was designed for which provides an intuitive experience for the user. Native applications can be more expensive than web applications, especially if you are designing multiple applications for each device. This is especially true if new phones with new software appear each year, requiring you to build a new app. Since native applications run through the devices store, edit times can be long if you have changes or additions to the application.

Web applications are mobile enabled websites that have a responsive build that is able to fit the size of the smart phone it is being accessed on. Typically web apps are written in HTML5 and do not go through the devices store which allows anyone with a smart phone to access the site through a web browser. Although the application cannot be added to the home screen in the same way a native app can, it can be bookmarked for easy access on the smart phone's home screen or browser. Typically web apps are a lower price range than native apps since only one version needs to be created. There is no need to create a separate app for every mobile operating system. Updates can be added easily and will appear instantly, since approval from the phones store is not required which makes editing times much faster than that of a native

app. Web apps do not use the devices' native features, so web apps do not have the superior functionality as native apps do which may not appeal to users in the same way.

After reviewing the survey data and the following points about each application type we choose to go with a web application for the following reasons:

- Community had several different types of devices (Blackberry, iPhone, Android, Windows).
- Large number of individuals indicated they would be changing phones in the future. It made sense to make an app that would accommodate that so we wouldn't have to rebuild again.
- Our price range was lower and better fit the cost of a web application build.
- We already had a few services (LibGuides, catalogue) that were mobile enabled.

Best Practices for Web Applications

Since the library would be designing and creating their own mobile site the group decided to examine other mobile sites and look into the literature in order to create a set of guidelines for developing a well functioning mobile site.

Six guidelines were created for the development of the Library's mobile site:
1. Mobile users expect to find what they need very quickly (half a minutes or less), so it is important to keep to a simple design (Klatt, 2011).
2. A mobile smart phone screen is much smaller than any desktop computer screen. It is important to scale down objects and the amount of text.
3. Using the mobile site should not involve pinching and zooming to view or select objects. A layout of 320 x 480 is a size that will fit most smartphone screens with a text size of 15 points (Hanson, 2011).
4. When adding content it is important to consider that most smartphone devices, in particular iPhones, are not compatible with Adobe Flash. If tutorials will be added, then they may have to be converted into a non-Flash format so they are accessible to the majority of smart phone users (Murphy, 2010).
5. The University of Regina Library's mobile site was built with a redirect. This means when a mobile phone tries to access the library webpage individuals are subsequently re-routed to the mobile site. This redirect is helpful for mobile users and is also a good way to promote a new mobile site. However, it can be frustrating for individuals who need to access the full site. Mobile sites typically do not contain all the information that the full website does due to the screen size of smart phone (Mairn, 2012). Individuals may want to access information from their mobile phone that is not available on the mobile site. It

is important to provide a link on the mobile site that links to the full site if a re-direct is being used (Hanson, 2011).

6. If images or graphics are added to the mobile site consider the size of each graphic and the download time for users who are in lower bandwidth areas.

(Nowlan, 2013)

Conclusion

The University of Regina Library's mobile site was launched seven months after the mobile working group was first assembled. There are always new technologies and services for mobile devices that require investigating. The Library's mobile site is in a stage of "perpetual beta" (DeMars, 2012) and will constantly be improving and changing. The Library is currently working towards providing mobile maps of the Library building, mobile study room booking, and providing PC availability. The goal of designing and building a library mobile site is to provide excellent service and information to its community, including the ever growing population of mobile enthusiasts.

References

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