12-2012

"Apps"—An Innovative Way to Share Extension Knowledge

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Notes/Citation Information
Published in *Journal of Extension*, v. 50, no. 6, article no. 6IAW2.

Journal of Extension
www.joe.org

December 2012
Volume 50 Number 6
Article Number: 6IAW2

"Apps"—An Innovative Way to Share Extension Knowledge

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Abstract: *Extension professionals across the country are continuously seeking innovative ways to reach clientele and to disseminate timely, educational information. A new avenue to reach clientele includes the use of smartphone "apps." The "Machinery Sizing" app, which was developed to ease the estimation of tractor horsepower to implement sizing for Extension clientele anytime, anywhere, is explained as a key example for Extension professionals to utilize apps in disseminating information to clientele. There are many benefits to using apps, including information availability wherever Internet service is available on the smartphone, ease of computations of equations, and automatic updates being sent to users.*

Introduction

Electronic technology is constantly changing. The advancements in technology allow users to literally have educational information, socialization, and other useful information, such as mapping features, at their fingertips. Therefore, to continuously disseminate useful, timely knowledge to Extension clientele by way of technology they are using, Extension professionals must adopt transformational methods to continue reaching stakeholders (Franke-Dvorak, Kelsey, & Royer, 2010). Guenther and Swan (2011) pointed out the need for using technology in Extension. They discovered that Extension clientele (successful potato farmers) used more electronic technology than university students. Seger (2011) posited many barriers to using technology in Extension activities but also noted several possibilities to expand Extension knowledge dissemination when new

technology is adopted. This article discusses the use of a machinery sizing smartphone application, or "app," as a new means to share Extension knowledge.

Overview of Machinery Sizing Extension Educational Material

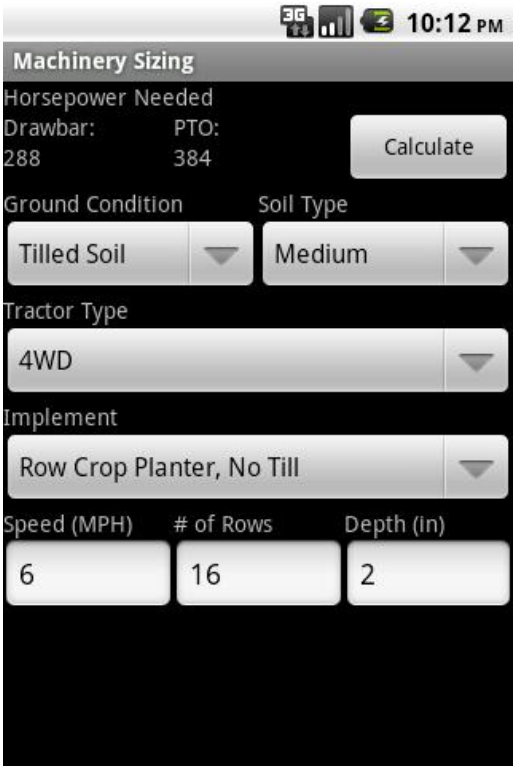
The American Society of Agricultural and Biological Engineers developed Standard D497.4 (ASAE, 2000) to estimate the tractor horsepower needed to pull different implements under various conditions. This standard presents information in an equation format with a table of coefficients that vary on parameters including implement type and dimension, operating conditions, and tractor type. To make this information more portable and usable to Extension clientele, an online spreadsheet was created that handled the calculation of the equation and provided the necessary coefficients (Price, 2010). The user only has to identify the implement's width, depth, pulling speed, soil conditions, and tractor type to determine the required tractor horsepower. The spreadsheet, which offers a significant advantage in usability over the original paper standard, is still not as portable as end users would like. To provide more portability, a smartphone app was developed.

Creation of the "Machinery Sizing" App

There are several types of smartphones, such as the iPhone, Blackberry, Android, and Windows Phone. An Android device was used to create the machinery sizing app because Android devices were common in Kansas according to local Extension professionals, and the development of an Android App was cheaper and easier to begin using than other platforms. Android programs can be developed on any Windows, Linux, or Mac computer, and creating a developer account to publish applications to the Android Market only costs a one-time fee of $25 (Android developers, 2011). The iOS platform used in iPhones was also considered but was rejected because of the requirement to use a Mac computer for development and the cost of subscriptions to be registered as a developer with Apple. Therefore, the machinery sizing Extension educational material explained previously was made into the "Machinery Sizing" App for Android devices and published to the Android Market to make it available to nearly every Android user. A screenshot of the "Machinery Sizing" App in use is shown in Figure 1.

Figure 1.

Screenshot of the "Machinery Sizing" App



The "Machinery Sizing" app is relatively simple and would take an experienced Android app developer less than 1 full day to program. For the author, who was new to Android programming and the Android market (yet has previous programming experience), the App took 3 to 6 days spread out over 2 months. Some time was spent learning about the Android system, which is based on the Java computer language. Programmers who have either taken a college-level introductory Java course or have previous experience creating basic Java programs should be able to create an app within several days.

Designing, testing, and publishing of the "Machinery Sizing" app actually took more time than programming the app. The design phase consisted of determining the layout of the app and what information to display to users. Testing was performed on several actual phones and various Android device emulators. In the publishing phase, the developer account was set up, and all the information was created on the Market website for the app. During publishing, it was necessary to obtain approval for use of the Extension service's name and logo in the program to follow university procedures. The entire app creation process from programming to testing to publishing is explained in Dvorak and Price (2011). To increase Extension clientele awareness of the app, it was publicized on the "Agricultural Today" radio show produced by Kansas State Research and Extension.

Results

The "Machinery Sizing" app has seen steady adoption since publication. Figure 2 shows the total number of active installs from March 19, 2011 to February 19, 2012. This graph is part of the information provided by the Android Market to the developer of an app. The Android Market also provides basic information on users such as home country (81.4% in United States), language used (94.5% use English), phone version (most common is the Motorola Droid X at 9.3%), and Android version (59.1% use Android 2.3.3+). In addition, the Android Market has made it easy to update information in the app through the app update process. After the initial publication of the "Machinery Sizing" app, ideas were brought forth for adding several more implements to complement high speed vertical tillage operations. The data for the new implements was added to the app, and a new version was created. The new version of the program was uploaded to the Android Market, and the Market notified users of the new version and updated the app when the users requested it.

Figure 2.

Active Installs of the "Machinery Sizing" App

Apps in Extension

Several benefits to using apps as a way to share Extension information were identified in this project. They include:

- Portability;
- Ability to perform complex calculations quickly; and
- Simple updating procedure.

Android apps have other features (Android developers, 2011) that might be useful in Extension projects but were not used in this project, such as:

- Current location information and maps;
- Internet connection;
- Motion sensors; and
- Camera.

Creating an app can be a very useful way to provide Extension educational material, but it is not suitable for every audience and situation. There are several points to keep in mind when developing an app, including:

- Different screen sizes can limit the displayable information.
- Programming expertise is required.
- Applications that do more than just calculations can take significant time to develop.
- Designing an app can be time consuming and needs to involve both programmers and Extension specialists with knowledge of how the app will be used by Extension clientele.
- Publishing apps and registering as a developer requires entering into contracts that may need approval by the employee's organization, and certain protocols need to be established by the organization before publication of the app to take care of proceeds, licensing agreements, and logo information.

Other apps have also been designed to disseminate Extension knowledge. McCullough, Waltz, Hudson, and

Martinez-Espinoza (2011) developed an app that pertained to turfgrass. They described offering the app for sale and the considerations involved. They mentioned the app information needs to be properly formatted for use on a smartphone because of screen size and input limitations. They also pointed out there are many development companies available to create apps if desired.

Conclusion

Although the machinery sizing app was created as an Android app, most other smartphone platforms should have similar benefits to Extension. One of the biggest advantages noticed in this project was that Extension information based on complex calculations could be shared in a portable, easy manner that was not available before. Also, the portability, computational power, and sensors in smartphones should be applicable to many different types of Extension material to meet the needs of stakeholders (Kelsey & Mariger, 2002). Considering the new capabilities provided by smartphones, apps can provide many opportunities for the dissemination of Extension information in the future to assist with "accomplish[ing] the land-grant mission of providing cutting-edge and relevant" information (Franke-Dvorak et al., 2010, p. 55).

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