

HARNESSING THE POWER OF PEOPLE – PHONE APPS FOR NATIONAL WEED SURVEILLANCE

Kym Johnson¹, Mathew Taylor², Geoff Norton² and Greg Blackburn²

¹Biosecurity Queensland, Department of Agriculture, Fisheries and Forestry
PO Box 280, Ipswich QLD 4305

²Biological Information Technology Group (QBIT), Centre for Plant Sciences,
Queensland Alliance for Agriculture and Food Innovation (QAAFI)
Level 6, Hartley Teakle Building, University of Queensland, St Lucia QLD 4072

ABSTRACT

Smart phone and tablet technologies have taken the world by storm. These tools are now available to all demographics and it is predicted that 87 percent of Australians will own a smart phone by 2015. The power and accessibility of this technology provides an unprecedented opportunity to access new audiences and improve two-way information flow. This includes the potential for in-field plant identification and mapping systems which can be deployed to tens of thousands of users. The University of Queensland's QAAFI-Biological Information Technology (QBIT) group has developed an easy to use identification tool covering all Australian declared plants and a large proportion of Queensland's non-declared environmental weeds. Currently in prototype form, the Weed Detector mobile app is based on the Lucid plant identification platform and has the capacity to guide users through the identification of plant species, collect GPS and photographic information and link to state and national weed mapping systems. The app is supported by detailed diagnostic photographs and more than 2,000 weed information sheets which are fully integrated into the tool so it can be used in areas where there is no internet access. This paper discusses the potential of this and other mobile technologies to revolutionise the way we look at weed surveillance... ensuring that weeds really do become everyone's business.

Keywords: Weed identification, mobile technologies, weed mapping, weed surveillance.

INTRODUCTION

Mobile technologies such as smart-phones and tablets have only been available to the general consumer since the launch of Apple's iPhone in 2007 (Donnelly 2011); yet, in just five years, they have become a common and almost essential part of every-day life for a large proportion of the population. For the first time in history, people have 24-7 access to the internet, their social networks and systems that can be used for anything from entertainment to medical diagnostics. This all-encompassing integration with the digital world has the potential to influence every sphere of society (Deloitte Access Economics 2013) and affords great opportunities for improved performance and service in workplace environments (Donnelly 2011). In addition, these tools provide the opportunity for the general community to participate and have a voice in large-scale issues and social causes. Easy to use 'apps' and social media networks mean there are fewer barriers to involvement and effective two-way communication channels can be created.

There is growing recognition within business and government run organisations that social media and mobile-accessible systems need to be established to keep pace with consumer and client service expectations. This will be an ever-evolving field, but already mobile

technologies provide unprecedented opportunities for improvements in information access and increased involvement in passive surveillance for new and emerging species.

WHY ARE APPS THE WAY OF THE FUTURE?

'Apps' is the commonly used colloquialism for applications. These are software programs which can interrogate a web server and present formatted information to the user (White 2010). In other words, they provide easy access to web based information in a format that is suitable to a mobile phone or tablet. The real attraction is the ease of use. Apps appear as icons on the phone or tablet screen and provide direct access to the information or tools. Games and entertainment apps are the most commonly downloaded, but focus is shifting to systems that enable the delivery of new and improved services (Adaptor 2012).

Australian mobile phone subscriptions hit 24.3 million in June 2012 – well over one per person (Australian Communications and Media Authority, 2012) and it is forecast that 87 percent of Australians will own a smart phone by 2015, up from 45 percent in 2011 (Telsyte/AIMIA 2012). In addition, Australians now spend more time using apps than the desktop and web combined (Adaptor 2012). This demonstrates a strong and rapid growth in the mobile technology sector, with the potential for heavy reliance on these tools for digital information in the future. According to Deloitte Access Economics (2013), a key difference with the mobile technology movement is that it is being driven by people – by consumers and employees. This is the reverse of previous decades where technological developments came from government and big business research agencies. In this instance it is government and big business that are being forced to keep pace with consumer demand.

A MOBILE SOLUTION – WHAT CAN IT OFFER?

In recent years, agricultural and NRM extension services have been significantly reduced and there has been increased reliance on web-based systems to deliver information to the general public. Although there is a wealth of information available, the move to predominantly web-based communication assumes that the public are actively seeking information. Not only is this un-true in many instances, but there is also significant evidence to suggest that knowledge alone is a poor driver of behaviour change (Kollmuss and Agyeman 2002).

More recent approaches to environmental and social communication such as community-based social marketing are more pragmatic and recognise the need to understand behavioural norms to identify and overcome barriers to behaviour change (McKenzie-Mohr 2000). New mobile technologies have the potential to address many of the barriers to community participation in weed surveillance and optimise early detection of new and emerging weeds. The capacity for 'one click' submission of records means that mobile apps could be extremely easy to use and act as a vehicle for increased community awareness, making the process of reporting weeds more attractive. Such a system would also enable administrators to rapidly update key information and distribute alerts directly to the public – enhancing the perception of social inclusion by providing a direct line of communication between weed managers and those actively involved in weed detection.

Natural resource management and agricultural sectors are traditionally considered slow to take up new technologies. However, this trend is changing, with regional Australians

showing increased levels of involvement in the online environment (Australian Communication and Media Authority 2012). A range of agricultural apps are available and in use by the Australian agricultural sector and lists have been compiled by Condamine Alliance: <http://www.condaminealliance.com.au/links#apps>; and the NSW Department of Primary Industries: <http://www.dpi.nsw.gov.au/agriculture/broadacre/videos/useful-apps>.

Locally relevant weed-related apps include: The University of Queensland's Environmental Weeds of Australia; WSQ's Weeds of Southern Queensland; GRDC's Weeds: The Ute Guide; and Condamine Alliance's NRM Plus. The Weeds of South East Queensland app is also due for release in the near future. Many of these tools provide the capacity to accurately identify weeds based on user-friendly identification keys and diagnostic images. However, the next step is to integrate identification, mapping, reporting and relevant management information into one, seamless system.

Currently in prototype form, the Weed Detector mobile app has been developed to achieve just this. It will work from the same Lucid identification platform as the Weeds of SE Qld and Environmental Weeds of Australia apps; however it will have the added advantage of enabling the collection of GPS and photographic information, as well as other agreed metrics. The Weed Detector app will also enable administrators to rapidly update key information and distribute alerts directly to the public. It is proposed that submitted data should be organised and stored in a national repository (linked to the Atlas of Living Australia), in addition to being integrated with state databases.

The weed database developed for the University of Queensland's Lucid identification key comprises more than 2,000 species, including the complete list of National alert species, declared weeds from all states and territories and a large number of non-listed weeds. It is supported by detailed diagnostic photographs and more than 2,000 weed information sheets. However, additional species can be added to the system as required.

To reduce the strain on herbarium services, it is proposed that a range of support systems are negotiated with weed management administrators. These could include the prioritisation of submissions based on species and distribution and the generation of automatic alerts when potential priority samples are submitted; the establishment of a network of local administrators to provide first tier identification support based on submitted photographs; rating of sample submissions (of low-priority weeds) based on the expertise of the submitter; and the capacity for administrators and key partners to request regular reports or interrogate the system periodically for information on target species.

CONCLUSION

Both the Intergovernmental Agreement on Biosecurity (COAG 2012) and the Australian Weeds Strategy (NRMMC 2006) state that improving Australia's biosecurity status through rapid detection and reporting of priority invasive plants is the responsibility of all Australians. However, the vast majority still lack the skills and awareness to contribute. It is now technologically possible to create an integrated solution to weed identification and reporting that can be deployed to tens of thousands of users via the smart phone or tablet, linking individuals to information and expert systems normally only available to large institutions such as herbariums and government departments. In return, it allows those responsible for strategic weed management to tap into the general population, increasing the capacity for passive surveillance well beyond the level we've previously had access to.

While mobile apps are not the panacea to all our problems – they will require effective and imaginative promotion and will not necessarily lead to active involvement in management; they do open up new and exciting avenues for communication and engagement. It is likely that mobile technology will continue to grow in popularity and that consumers will increasingly expect organisations to provide services and systems that are supported by these tools. By taking advantage of these opportunities and truly harnessing the power of people, we have the potential to change the face of weed surveillance in Australia.

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