ABS iPhone App – The Way of the Future?

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"As we enter the 'post-PC' era, National Statistical Offices (NSO) face the challenge of evolving their dissemination practices so as to remain relevant to the wider user community in a changing environment demanding instant access. The Australian Bureau of Statistics (ABS) has started this journey with the development of an iPhone application to supplement traditional dissemination options. This paper explores why the ABS has taken this path, the issues encountered and the outcomes that have been achieved. The paper also discusses the possible future directions in dissemination that NSO's will need to consider moving forward."

Views expressed in this paper are those of the author and do not necessarily represent those of the Australian Bureau of Statistics.

Key Words: dissemination, mobile, statistical literacy.

1. Introduction

Traditionally National Statistics Offices (NSO) have disseminated their information through formal publications (PDF documents with data and commentary) and associated media releases, with supplementary spreadsheets, datacubes and metadata. The target audiences of these dissemination practices have been twofold. First, the media and flow-on dissemination to the wider community, and second, high end users such as economists and policy developers who want to analyse the data in some depth. However, we are now facing new challenges of technological advances that are fuelling social change with users requiring instant and easy access to information. As a result, NSO's are being forced to recognise changes in their audience, and therefore the dissemination of their information must also change to suit the needs of the audience.

The development of tablets and smartphones has resulted in more and more often, people conducting their lives online. This is leading to a requirement that organisations have products that are accessible whenever, wherever if they wish to remain relevant. This is perhaps most obvious in the print media and retail spheres where on-line has made significant inroads into the traditional way of doing business. However, moving to a new platform doesn't necessarily mean moving your current content as it is – rather content should be created around the targeted platform to ensure the best experience for the end user.

While these developments in technology do not represent the death of NSO's current dissemination practices, it is critical that NSO's dissemination practices evolve to meet the changing environment in order to remain relevant to the wider user community.

The Australian Bureau of Statistics (ABS) has started this journey with the development of an iPhone application (App) to supplement traditional dissemination options. This paper explores why the ABS has taken this path, the issues encountered and the outcomes that have been achieved. The paper also discusses the possible future directions in dissemination that NSO's will need to consider moving forward.

2. Background – ABS Dissemination: The Current State of Play

The first ABS publications were released early in the 20th century. They were hand compiled and released in hard copy after being typeset and printed. The ABS was an early adopter of issuing press or media releases to ensure wider dissemination of information introducing such releases in the 1920s. ABS moved into electronic dissemination in the 1980s, and launched its website (abs.gov.au) in 1995[1].

Subsequent to the development of the ABS website, the dissemination strategy has largely centred around this as a means of disseminating publications in PDF format,

time series in spreadsheet format, and statistics in multi-dimensional structures in the form of datacubes. Generally accompanying the data are analyses in the way of main features, explanatory notes, quality statements and extensive media releases.

In the 17 years since its launch, the ABS website has very much developed to now be the primary form of dissemination. It consists of over a million web pages and in 2011-12 the ABS website had 11.3 million visitors and 2.2 million product downloads[2].

3. A New Paradigm – The Post-PC Device
The launch of the iPhone in 2007 changed everything about mobile phones and how people use them. The iPhone provided an inexpensive way to connect to the Internet and it made using the Internet on your phone something anyone could do - anytime, anywhere. As a result of people always being online, social media use exploded and people are increasingly conducting their lives online with the expectation of instantaneous information.

In Australia research shows that there is a very high penetration for smartphones with estimates of 76% of the adult population having smartphones. Similarly the penetration of tablets is high with an estimated 40% of the adult population owning a tablet[3]. These devices provide a cheaper and more convenient way for people to connect to the Internet – especially for those in a lower socio-economic group, more remote or technologically challenged people. This leads to a very significant increase in consumption of information with less skill and support required.

The adoption of these technologies results in a very different environment to the desktop Personal Computers (PC) that current dissemination strategies are targeted towards. With traditional PCs, interactions were an arm's length activity. The use of the PC was defined by a formal start and finish time and generally used in the same location. In comparison, smartphones and tablets are always on and can be used anywhere and anytime which provides for a much more intimate experience.

As a result mobile devices have many advantages over traditional PC's – and while stating the obvious, the first and most important advantage is that mobile devices are in fact even more personal than the PC. Mobile devices are always with the user – they know where they are, and they are able to interact with information around the user. It is now standard for smartphones to have GPS, cameras, microphones and even a gyroscope – these sensors allow the device to know a lot about what is around it and how it can interact with it and reveal important information to the user in the moment. Using these sensors it is possible to save the user the effort of manually entering the information required to provide the relevant information the user wants.

While the iPad and the iPhone would not seem the most usable devices for someone with vision impairment – they are 100% accessible straight out of the box. Users who are visually impaired can interact with the device using the built in VoiceOver utility - sliding their finger over the screen, the device will speak to them the options available to them. This means that with minimal effort in the development of an app, developers can provide fully accessible apps for users with a visual disability – which is very important to the ABS in the quest to make the website compliant to Level A of the Web content accessibility guidelines version 2.0 (WCAG 2.0)[4] standard which is a requirement of all Australian Government Websites.

As noted at the outset, the trick with a new platform is not to move your current content as is, but rather the content has to be developed around the platform to maximise its value to the user community. This dilemma was best expressed by Horace Dediu, a technology industry analyst: "This brings up another corollary: fundamentally, you can't move an existing media to a new network. You have to think of it as a deeply rooted-in system, and it's just not going to like moving to another environment. You have to uproot this huge tree, and it just won't come out and if it did it will not take root in a new place.

This is the problem for the technology industry today. The only way technology companies can solve the "content is king" dilemma (which, by the way, is an euphemism for "Hollywood is king and Silicon Valley isn't"), is by allowing new content to flourish on top of new platforms. It's not about moving the old content to the new platform. It's about allowing new content to be created exclusively on the new platforms. This new content will therefore, by our law, be a new medium"[5].

In brief the post-pc device has generated a whole new segment of the market – i.e. the casual user who wants information here and now and in a format they can readily access and understand. At the same time it has also raised the expectations of the more serious user, who likewise wants to be able to access data instantly so that they are continuously informed. In either case the NSO needs to respond positively so as to not miss the chance of increasing statistical literacy or enhancing informed decision-making.

The native verse hybrid web app debate
One of the biggest decisions to make when starting to develop an app is to make the choice between developing a native app or a web based hybrid app and both have their advantages and disadvantages.

A native application is an app that has been developed for a specific platform and is able to make use of all of the phones controls (buttons, tabs) and the hardware features of the phone – GPS, Camera, microphone, etc. A web app is built using HTML and offers a cross-platform solution that will run on any device. Web apps can be wrapped inside a native wrapper to give them access to the hardware features of the phone.

Each Mobile platform offers a different user experience and provides their own user interface controls – for example an iOS Apps make use of an onscreen back button to navigate while Android Apps rely on the devices physical back button. Users expect a level of consistent experience between Apps on their device, which also leads to a shorter learning curve when using new Apps.

Native apps are generally more expensive to develop initially as an app must be developed for each platform; however it provides much better performance and user experience. With native apps, developers can use device specific controls and conventions and by developing for each of the platforms, apps can be customised to meet the user's expectation of how the app should work.

Web apps are cheaper and easier to maintain at first, however they suffer from performance issues and do not provide as good a user experience. As not all interface controls are common across platforms, web apps are either limited to the lowest common denominator of controls, or try to emulate the more popular. Martin Fowler points out that:

"Emulation has a couple of difficulties: firstly it's hard to get an emulated UI to perform responsively enough - which is a big deal for UI controls. Secondly it's very difficult to get them to perform exactly like the native controls. It's easy to get trapped in an uncanny valley where things work mostly like the native controls but there are just enough tiny differences to throw users off. With UI controls you have to be really anal to get the behaviour 'just right'"[6].

While both native and web apps have their place when used correctly, initial costs should not be the motivating factor at the expense of the user experience.

5. The ABS iPhone Application

5.1 Market
There was no formal assessment or research to identify the target audience as to the market for an ABS iPhone app - the idea for the app simply came from the rapid growth in the popularity of smartphone apps and the identified problem of surfacing key data on the ABS website. In that regard it could be viewed as an act of faith or in the words of 'Shoeless' Joe Jackson-- "if you build it he will come"[7].

The expectation, as discussed in the previous section, was that both the casual and the more serious user would have a need for such an app. While researchers and data analysts will continue to use traditionally disseminated data and associated metadata from the website for high level analysis/research, it is anticipated that both the serious and not so serious user would make use of the app looking for instant access to information without having to navigate the ABS website – a challenge on a mobile device even for statisticians! In that regard it was anticipated that the ABS iPhone app would very much be an opportunity to expose many more people to the world of statistics, as well as providing an opportunity to increase statistical literacy.

A review of international practice at the time indicated little in the way of statistical iPhone apps and there was little opportunity to confer with international colleagues as to their intentions. Suffice to say a more recent review has identified an increasing number of apps including Eurostat Country Profile and Americas Economy for iPad. Clearly there would seem to be some recognition by other agencies that you 'have to be in it to win it'.

5.2 Product
In the context of the informal market analysis above and with ABS data not being readily available in a machine readable format, it was decided to constrain the initial development to key economic data; population estimates and detailed census data that could be readily presented on a smartphone screen. Specifically the app presents latest estimates for a small number of Key Indicators including - Consumer Price Index, Estimated Resident Population, Gross Domestic Product, Average Weekly Earnings and Retail turnover; 2011 Census Data and the Australian Population clock.

The key economic data are sourced from ABS publication Key Economic Indicators (cat no 1345.0), which is a web only product that brings together all key economic data and is updated on a continuous basis as new data are released. The use of a single data source addressed one of the major issues in terms of developing the app. The indicators presented on the app can be sorted by the users so they can select and view their personal preferences in personalised order. . Metadata is provided to explain what each indicator represents.

Census data are all stored on the device and allows users to search for a specific locality or they can nominate to use the inbuilt GPS to calculate their location. Census data covers Person, Family and Household data as well enabling the user to view the area on map.

The Australian Population Clock is one of the most popular pages on the ABS website and was considered an essential feature for the app. Users can watch the population tick over and find information on how that number is calculated.

The app also provides information about the ABS and provides users with a way to engage with the ABS via its social media channels or a link to the website to find more detailed data.

For the technically minded, the app was developed as a native application using Appcelerator's Titanium Mobile framework. Titanium Mobile allows developers to develop the logic of the app in JavaScript and overlay the native user interface of the platform developed for - this means that with minimal changes to the app logic, an Android App could be produced. During the design and development lots of attention was paid to the app to ensure it was true to the expected usability of iOS apps. This is best demonstrated by the use of the 'Pull-to-refresh' gesture to update the Key Indicator data.

5.3 Costs
The development of the app was undertaken by this author over 2011-12 and the early part of 2012-13. Direct costs were of the order of 0.5 staff years. Ongoing support

costs are anticipated to be of the order of 0.1 staff years per year. There was an additional small one-off cost associated with data validation in the initial development.

5.4 Issues

The biggest challenge in developing the app and for any future enhancements to the app is with finding an appropriate data source. Currently the ABS does not output all of its data in a machine-readable format i.e. a data format that can be parsed by a computer such as XML or JSON; and not all data are not released in a consistent format. To get around this limitation, the app accesses a single compendium publication (i.e. 1345.0) on the ABS website which is essentially a table of the Key Indicators that are manually uploaded to the web on a continuous basis. As such it provided a single source of data that could be extracted to the device. This provided a consistent data source that would meet the short-term requirement while the ABS continues to develop and investigate future data dissemination options.

While developing the app special consideration had to be given to when, and where the user might be using the app. Specifically the app was designed so as to ensure the app was fully usable without an Internet connection, with the only real requirement for the Internet being to update the key indicator data.

5.5 Outcomes

While it is hard to quantify the success of the app so far, the ABS iPhone app has been downloaded over 8000 times since its formal release in October 2012 and has received very positive feedback from users. While 8000 downloads in a smartphone population in Australia of the order of 12 million may not seem a lot, it is still early days. At a minimum the app has raised awareness of the work being undertaken by the ABS to increase the use and understanding of statistics.

6. Where to from Here

The development of the ABS iPhone app is very much just a toe in the water at this stage. However, it raises a number of strategic issues in terms of where to from here.

The immediate challenges for the ABS are twofold. On the practical level, consideration needs to be given to the development of an Android app. That decision will clearly be influenced by the take-up of the iPhone app and the costs associated with developing an Android version. However as noted earlier the design of the app should facilitate an easy transition to an Android app.

The second and more conceptual challenge for the ABS is that the development of the app has highlighted area of weakness with the current dissemination systems in terms of the data not being available in machine-readable format. Such issues have the potential to severely constrain the capability in terms of development of apps and also the surfacing of data in machine-readable formats. In addressing this, the ABS is engaged with an international community of NSOs in developing an interactive free online tool that presents data in a searchable, flexible and dynamic way. This tool allows the exchange of data between computer systems (the machine-to-machine services) facilitating the sharing of data through a programmatic interface across the Internet.

There is no doubt some who would suggest that the tablet/phone user is not a serious user and the commitment to such developments should be commensurate – they well may be the same people who said the Internet was for geeks and nerds!

Steve Jobs summed up the move to the Post-PC era by saying: "When we were an agrarian nation, all cars were trucks because that's what you needed on the farm. As vehicles started to be used in urban centers, and as America started to move into those urban centers, cars got more popular and innovations like automatic transmissions, power steering and things you didn't care about in a truck started to become paramount in cars. Today, maybe 1 in 25 or 1 in 30 vehicles is a truck where it used to be 100%. PC's are going to be like trucks. They will still be around and provide a lot of value but they will be used by 1 out of X people.

This transformation will make some people uneasy. People from the PC world, like you and me because PC's have taken us a long way. It's brilliant. We talk about the post-PC era but when it really starts to happen, I think it's uncomfortable for a lot of people. Because it's change. A lot of vested interests will change. Things will be different. I think we're embarked on that. Is it the iPad? Who knows? Will it happen next year, 5 years from now, 7 years from now? Who knows? But we're headed there."[8]

Development of a mobile application is not the only solution to future dissemination challenges for NSOs. It should been seen as a piece of the puzzle. The key piece to the puzzle is a device agnostic website for the dissemination of data and associated metadata. NSO websites should evolve to make the discovery of statistics easier and as a vehicle to tell the story of statistics. Mobile and web apps should be used to supplement the surfacing of the data.

While this author has only looked at mobile apps as a tool to disseminate statistics, I believe they will add even greater value in the collection of data for NSOs. Post-PC devices provide a way to collect more complete data while reducing the burden on the data provider.

As Horace Dediu said "Apps are a phenomenon that will result in something bigger than we can imagine. The way to think about apps is as a new medium, a new art form that provides something functional. The value of having apps is plainly evident, the economics, creative energy and dynamism of apps cannot be overestimated."[9]

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