Mobile everything

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This article provides an overview on recent developments in mobile computing. It begins by outlining current mobile usage trends in Australia and the range of mobile technologies currently on the market. It then discusses different options for information presentation via mobile devices, responsive web design and emerging user behaviours. The final section examines enterprise applications of mobile devices and ends with the key takeaways for information professionals wanting to use mobile devices as part of an information management strategy.

BLINK AND YOU'LL MISS IT

There is a problem in writing about the world of mobile computing at the moment – the speed with which it changes. By the time you read this article, it will already be out-of-date. Market leaders will have become underdogs, new devices will have been created and old devices will have been resurrected. In some respects, we are witnessing the end of the 40-year technology trend. The first mobile phone call was made in 1973. Mobile phones have steadily increased in power and functionality year by year until they are now barely recognisable as phones. The emerging generation of devices probably leave the phone-form factor and label behind.

Mobile devices change the ways in which (and the places where) users consume and interact with information. They can present both threats and opportunities to information professionals. The main threat is one of irrelevance – if the information that we manage presents a poor mobile experience, then we risk being ignored or (if they have no choice but to interact with us) losing the goodwill of our stakeholders. There is also a more subtle risk of misdirected resources. The next stage after an overly dismissive attitude to any new technology is one of panicked and ill-informed action and investment. The answer to every information provision issue is not the creation of a new app. Care should be taken in understanding the contexts of information use.

The opportunity is simply that if mobile technology is harnessed well, we get to help the providers and users of our information in new ways and in new places. We get to have an impact that we could not have imagined 10 years ago. The first step to this is to be clear on what these technologies are and the actual extent of their reach.

MOBILE AUSTRALIA

Traditional mobile phones (such as the indestructible brick of the old Nokia 3310) offered limited calls and SMS functionality. Then in the early 2000s, devices such as the Blackberry and the Palm Treo added email. These were quickly adopted by business users but did not necessarily fire the imagination of the general public. In 2007, the iPhone took the features and functionality of the phone to another level with a single store of software that did not require complicated installation steps ("apps") and a user experience that appealed to the consumer market. Apple's early lead with the iPhone has since been challenged by phones that combine Google's Android software with hardware produced by a range of manufacturers, chief among them Samsung. These smartphones with cameras, media players, email, web browsers and a variety of apps are only incidentally phones. Rather, they are computers that fit in a pocket or purse and can (occasionally) be used to make telephone calls.

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Along with smartphones, other devices have emerged. Laptops shrank and smaller siblings arrived as notebooks and ultrabooks. The concept of the "tablet" – a touchscreen device larger than a phone but still portable – had been around for years but did not make a market impact until Apple launched the iPad in 2010. Tablet screen sizes are comparable to book or magazine formats, and also make for comfortable video viewing. Many publishers are hoping that tablet devices will offer new publishing opportunities.

Wearable sports devices such as the Jawbone Up, Nike+ FuelBand and Fitbit track the physical activity of the wearer. A friend who wears a Jawbone talked about its impact on his life. He said that it had led to two changes in behaviour. First, he had taken to parking his car further from his office to increase the amount of walking he has to do and secondly, it had confirmed that he had some sleeping issues (the device measures light vs deep sleep vs wakefulness). These devices do always promote a more peaceful life but at least one spouse has noticed evidence of suspicious night-time activity in their significant other's data. These devices should be avoided by would-be adulterers.

The most controversial device due for release is Google Glass. This is a wearable computer with a head mounted optical display. The possibility of wearers secretly video recording events and conversations has caused some pre-release bans of the device to be issued.

The statistics around smartphone usage are staggering. Smartphone penetration in Australia is somewhere north of 50% of the adult population and tablet device usage is over 25%.[1] These levels of smartphone usage are comparable to the US and Europe. Smartphone and tablet users are visible (although often less audible than traditional mobile phone users) on public transport and public spaces. These devices have moved from the exotic to the ubiquitous in a short space of time.

New behaviours are emerging around these devices that are in turn changing the operations of many industries. People do not use one device (or function) consistently but move between multiple screens, sometimes simultaneously. Fifteen years ago there was a lot of discussion about "interactive TV" – ie making the TV a two-way rather than one-way device. We now have interactive TV but it does not resemble the models of the late 1990s. Viewers use software such as Twitter or Facebook on mobile devices to discuss TV programs. While TV drives tweets, there is also evidence that Twitter drives TV viewing; although this behaviour is stronger for some genres (reality TV) than others (drama).[2]

Mobile devices are also being used for "Showrooming": when consumers see a product in a physical store and then use their mobile device to see if they can buy it cheaper online. Over 70% of smartphone users do this – which worries retailers. However, it is not all grim news for bricks and mortar stores – shoppers who use their mobile phones more while shopping tend to spend more than less frequent users. And the opposite purpose, using the internet to research a product then buy it in-store (known as "Webrooming") may even be more popular than showrooming.[3] This can be a good thing for retailers if they manage their web presences well.

WHO ARE THE MAJOR MOBILE DEVICE PLAYERS?

Since 2007, Apple has become a key player in the smartphone market, shaping the direction that the market takes. The iPhone and iPad are integrated products in that the hardware and operating system software are proprietary to Apple. However Apple does not make everything that can be used on its devices. Third party developers can create and sell software products via Apple's App Store in return

[1] Australian Communications and Media Authority, *Communications Report 2011-12 Series: Report 3 – Smartphones and Tablets: Take-up and Use in Australia – Summary Report* (2012), http://www.acma.gov.au/webwr/_assets/main/lib310665/report-3-smartphones_tablets-summary.pdf.

[2] Nielsen, *The Follow Back: Understanding the Two-Way Casual Influence Between Twitter Activity and TV Viewership* (8 June 2013), http://www.nielsen.com/us/en/newswire/2013/the-follow-back--understanding-the-two-way-causal-influence-betw.html.

[3] Accenture, *How Seamless Are You?* (2013), http://www.accenture.com/Microsites/retail-research/Documents/pdf/Accenture-Seamless-Retail-Research-Findings.pdf; Google, *How Mobile Is Transforming the Shopping Experience in Stores* (2013), http://www.google.com/think/research-studies/mobile-in-store.html; Urban Land Institute, Generation Y: Shopping and Entertainment in the Digital Age (2013), http://www.uli.org/wp-content/uploads/ULI-Documents/Generation-Y-Shopping-and-Entertainment-in-the-Digital-Age.pdf.

for Apple taking a cut of revenue. Apple's approach makes life easier for users (you don't have to type in commands to install software, just tap an icon) but users trade ease of use for control over their device. This is a trade that the majority of users have been happy to make. In general, Apple is known as a company obsessed with control and this is reflected in its products.

Like many technology environments, the mobile device environment is not necessarily a matter of competing companies but competing ecosystems. The other main mobile ecosystem centres around Google's Android operating system. Unlike Apple, Google only provides the operating system for the device. The hardware is manufactured by a number of consumer electronics companies, the dominant one being Samsung. Android devices are often cheaper than those of Apple and Android's market share has grown dramatically over the last year, especially in emerging markets. The competitive nature of the mobile market has been highlighted by the escalating legal actions by Apple and Samsung against alleged patent infringements by each other's products.[4] Android-based devices are often cheaper than Apple's products and this has helped them carve out a big presence in markets such as Asia. Critics of Android highlight the split between software and hardware development and claim that this leads to a poorer user experience. Supporters of the Android ecosystem would claim that it can respond to user needs in a more timely and flexible manner.

While the Apple vs Google/Samsung battle is headline news, there are other operating systems with smaller market shares. Blackberry has its own products with combined hardware and software (more on the mixed fortunes of Blackberry below). Microsoft offers the Windows Phone operating system and has partnered primarily with Nokia (another former phone giant who has abandoned its own Symbian operating system) but also with other hardware vendors such as HTC. While both product sets have received good reviews, they have not captured significant shares of the market yet.

DO WE NEED A MOBILE APP?

In comparing mobile platforms, the online information provider is immediately faced with a set of choices – first, around how information should be presented and secondly, around platform.

The first question asks how should the provider present information to the user via a device? The easiest option is to simply ignore mobile users as a separate group. Create a website and mobile users can access it via their browser. This option may be valid if your content is simple or mobile users make up a small proportion of site visitors (most web analytics tools will allow the provider to segment visitors by browser type).

A more sophisticated option is to present your content differently to mobile users – ie in a form they can navigate and interact with more easily. There may be a cost to doing this but some publishing tools such as WordPress automatically present content in different ways to users based on the browser settings and type of device. This may involve presenting the user with less information or presenting that information in a radically different way.

Responsive Web Design (RWD) has become a hot topic in the web world.[5] RWD tries to deal with the need to present the same information to multiple different devices with different characteristics. While screen size is the most obvious factor to change, the move from mouse to finger-driven touchscreen is as important – buttons on mobile touchscreen devices should be bigger than on PCs because of this. Hence the layout of a webpage can change dramatically based on the device accessing it. The grids that structure the page are fluid rather than rigid. Images can be resized and certain elements left out completely. Web developers are still working through the issues that mobile devices present – many are designing for "mobile first" then desktop etc – but the issues are far from fully resolved.[6]

[4] Decker S, "Apple's Legal Wins Show No Clear Victor in Patent War" (11 August 2013), http://www.bloomberg.com/news/2013-08-11/apple-s-legal-wins-show-no-clear-victor-in-patent-war.html.

[5] Marcotte E, "Responsive Web Design" (25 May 2010), http://alistapart.com/article/responsive-web-design.

[6] Walter S, "The State of Responsive Web Design" (29 May 2013), http://mobile.smashingmagazine.com/2013/05/29/the-state-of-responsive-web-design.

The next level of sophistication is where things get tricky (and potentially expensive). If the provider wants to start using some of the capabilities built into the device (such as camera, compass, geolocation) or they want the information to be interacted with when the user may not be connected to the internet, then they have to move beyond a traditional site. The answer to this has been to write an app that can then be uploaded and distributed via the app store of the relevant platform. Essentially, the provider is creating a new piece of software. The advantage is that a well-designed app can hide much of the complexity from a user and provide a more seamless and a richer experience. The disadvantage is the increased development and maintenance costs – especially because each platform requires the app to be rewritten and submitted in the language of that platform.

The latest version of the language used to build websites, HTML5, offers some of the flexibility of apps such as access to some device functions for offline use. HTML5 has been slow to catch on among developers by itself (apps are still preferred) but hybrid apps are growing in popularity. Hybrid apps consist of a platform app wrapper (downloaded via an app store) and HTML5 content that can be more easily created and updated.

The second key decision concerns which platforms to focus on. Obviously app development requires a decision about platform investment but even optimising your current site will require you to test it on multiple devices. This is where an understanding of market trends must meet an understanding of your own user base. It should be noted that the user demographics of different platforms vary – Android users tend to skew younger and poorer than iPhone users.

ENTERPRISE MOBILE

The big story in recent years has been the explosion in consumer mobile computing but there is an equally important but less visible story around the penetration of these devices into organisational settings.

BYOH (Bring Your Own Headache)

A strange flip occurred in the last decade regarding technology in the enterprise. In the past, workers had access to the best technology courtesy of their employers and generally went home to inferior tech. However, this is no longer the case. The fate of Blackberry provides a salutary example. In 1999, Research In Motion (as it was formerly known) launched the Blackberry 850 pager. This device could receive email from a Microsoft Exchange server. Over the next eight years, the Blackberry range came to dominate the business smartphone market. In any airport lounge, you could see harassed executives scanning emails or punching text in via the cramped but practical keypad. IT departments liked the Blackberry because of its security and encryption capabilities. The Blackberry put the corporate market first and the consumer market followed.

This strategy worked well – until it didn't. In 2007, the iPhone was launched with a focus on the consumer market – a touchscreen interface, a simplified "app" approach to software deployment and strong multimedia capabilities. Staff wanted to use their own smartphones for work. Importantly, senior staff had been making these demands. Blackberry has been edged out of its corporate stronghold by Apple and Android phones. Blackberry's smartphone market share peaked in 2010 and it announced a loss in 2013.

BYOD (Bring Your Own Device) policies now allow staff to access enterprise systems with their own hardware. There are benefits and challenges to BYOD for organisations. BYOD can reduce hardware costs because the employee picks up the tab. It is also claimed that BYOD results in greater worker productivity as staff do their work on devices that they know well and own. Cisco claims that comprehensive BYOD implementations yield an annual benefit of $1,300 per employee.[7] However, BYOD causes new headaches for IT departments in the areas of cost and security. The cost of developing, testing and maintaining an enterprise system increases with each additional platform and device that it has to work on. Security features were less of a priority for consumer-focused

[7] Cisco, *The Financial Impact of BYOD: A Model of BYOD's Benefits to Global Companies* (2013), http://www.cisco.com/web/about/ac79/docs/re/byod/BYOD-Economics_Econ_Analysis.pdf.

smartphone manufacturers as those features were not of primary concern to their buyers. Now smartphones are offer the option of multiple personas ("work" and "personal") on a single device with separate software and data. Corporate-owned data can be remotely wiped if the phone is compromised.

Mobile and enterprise content applications

An AIIM (Association for Information and Image Management) survey found that over two-thirds of respondents considered mobile access to content important for their organisations.[8] However, the impact of mobile devices has not been felt equally across all enterprise information systems. Another AIIM survey found that in over 90% of respondents' organisations, company email could be accessed via a mobile device in some manner (app, mobile webpage or conventional webpage), while less than 40% of respondents could make the same claim about Enterprise Content Management (ECM) or Enterprise 2.0 systems, with the number going down to 20% for Records Management (RM) or Enterprise Resource Planning (ERP) tools.[9] The focus is clearly on activities that involve the scanning of brief content or the posting of brief interactions. Systems with a heavy data or transactional focus are less of a priority for mobile access. Complexity of interaction with these systems is higher and less comfortable on a smaller device. The survey also highlighted the importance of mobile format to the perceived success of the implementation. The presentation of information through a mobile led to greater success than the use of a conventional or mobile-enabled webpage. These apps are also beginning to use the full functionality of the smartphone – 38% used the camera function. The overall business impact is variable – 35% were very pleased with the business benefits of their mobile applications, 42% considered them to be useful and 22% admit they haven't got it right yet. As for governance, just over 50% of respondents had a mobile device use policy in place that staff were well aware of.

While mobile device usage is now common, the development of mobile-ready business applications beyond email is still immature. Organisations need to ensure that the mobile applications they implement offer a high-quality experience – something that enterprise software has traditionally been poor at delivering. If they don't, then employees will gravitate to the least painful version of the system (be it desktop or mobile) rather than the one that is most effective for their needs at the time. The other related challenge is to ensure that the experience is integrated across multiple screens – ie the work I do on one device can be easily continued on another.

How should information professionals tackle the mobile environment?

As alluded to in the introduction, the temptation when faced with emerging technology is to either ignore it or rush into it headlong. A better approach than either of these is to clearly understand what your goals and your context are before developing a solution.

Most information professionals are not working in a "greenfield" environment. You will have existing information holdings that you make available through a variety of channels. If you want to commence a mobile project, you should understand how your stakeholders are interacting with your information (they may be information providers as well as users) and the devices they use. Use of web-based information should be measured with tools such as Google Analytics or Webtrends. Typically these tools can identify the types of device accessing your content – how many of them are mobile? Are there particular items that are of unusual interest to mobile users? At the same time, mobile devices are used in the physical world. Get out into the physical environment and observe what your stakeholders are doing. Are they googling books on their smartphone in your library or taking photos of specific things? In both situations, you can ask people why they are doing what you are observing them doing. In a physical environment you can politely ask them. In an online environment, you can use a simple survey.

[8] AIIM, *ECM at the Crossroads – Key Strategy Choices for Universal Content Management* (2013), http://www.aiim.org/Research-and-Publications/Research/Industry-Watch/ECM-2013 (member access).

[9] AIIM, *Making the Most of Mobile – Content on the Move* (2012), http://www.aiim.org/Research-and-Publications/Research/AIIM-White-Papers/Making-the-Most-of-Mobile (member access).

At the same time, you need to keep the overall purpose in mind. Mobile pages or apps that you decide to develop should be closely aligned with your overall information goals rather than just something that you think might be cool. The benefits that a mobile solution delivers both to your users and also to yourself should be identified up-front. In developing a solution, think about whether you use an external services provider or you develop it in-house. If you are a small organisation, you may have no choice. However, if you have an IT team, then while an external supplier can probably provide a first solution quicker and at higher quality, it may not be the best solution in the longer term if you need to maintain or update your solution. Once the mobile solution has been developed, it is vital to properly test it in realistic situations in the field (and sometimes that might literally mean "in the field") and to monitor usage and user behaviour over time.

Mobile technology offers information professionals many new opportunities to provide better experiences for those who use our services and we need to take advantage of them now. In short, mobile means we must get out more.