



Australian
Communications
and Media Authority

Communications report
2011–12 series
**Report 3—
Smartphones and tablets
Take-up and use in
Australia**

communicating | facilitating | regulating

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Executive summary

In 2011–12, the mobile phone market appeared to be reaching saturation level, with the number of mobile services in operation increasing by only three per cent compared with 13 per cent during 2010–11. The major mobile marketplace changes were driven by the rapid take-up of smartphones and tablets as mobile devices were being upgraded and new tablets acquired by consumers, and by ongoing improvements in internet access.

In response to this challenge to existing business models, Australian mobile telecommunications service providers have sought to diversify revenue streams through this smartphone and tablet services market, by supporting take-up and use.

This strategy has seen considerable success in identifying and meeting consumer demand, with an estimated 8.67 million smartphone and 4.37 million tablet users in Australia at May 2012. Also, consumers are using these devices to provide complementary services, with 3.65 million using both a mobile phone and a tablet to access the internet.

The growth in smartphone usage has given rise to significant growth in mobile phone internet access and data usage. In comparison to other mobile phone users, smartphone users are:

- > nine times more likely to go online via their handsets
- > four times more likely to purchase goods online
- > three times more likely to stream or download audio or video content
- > three times more likely to pay bills online
- > twice as likely to access social networking sites.

The upgrading of mobile networks to support 4G services and the expansion of WiFi networks, have been key facilitators for the development of the smartphone/tablet market in Australia. The three mobile carriers are either in the process of upgrading their networks to support 4G or are planning for this to occur in 2013, and two million Australians used a WiFi hotspot in the June 2012 quarter.

The functionality and ease of internet access provided by smartphones and tablets has been greatly enhanced by the proliferation of applications (apps). During June 2012, an estimated 4.5 million Australians downloaded a mobile app.

The extension of smartphone and tablet take-up and functionality drives innovation and emerging services, such as developments in mobile payments (mobile wallet), mobile cloud computing and near-field communications—facilitating services such as micropayments, location-based information services and ticketing. However, the growth in take-up of smartphones and tablets is also disruptive, presenting challenges to both industry and consumers.

Mobile phone voice over internet protocol (VoIP) has already seen significant growth in 2011–12 with an estimated 616,000 users at June 2012—an increase of 133 per cent since June 2011, leading to erosion of carriers' voice and messaging revenue streams.

The increasing use of mobile apps has seen a rise in mobile data usage and an increase in the number of consumers experiencing 'bill shock'—receiving an unexpectedly high mobile phone bill. This was a key issue addressed by the ACMA in its *Reconnecting the Customer* public inquiry and the subsequent registration of the industry's new Telecommunications Consumer Protections code in September 2012, which aim to improve service provider performance in areas such as billing, advertising and complaint-handling.

Table 1 Smartphone and tablet market, Australia—key indicators, 2011–12

Key indicator	June 2011	June 2012	% change
Mobile services in operation	29.28 m	30.20 m	+3.1%
Mobile internet subscribers	18.11 m	22.05 m	+21.8%
Persons 18 years+ with a smartphone	4.25 m	8.67 m (May 2012)	+104%
Persons 14 years+ using WiFi hotspots during the June quarter	1.56 m	2.06 m	+32.1%
Smartphone users aged 18 years+ downloading mobile apps during June	2.41 m	4.45 m	+85%
Persons 18 years+ going online via*:	May 2012		
> mobile phones	9.19 m		
> tablets	4.37 m		
> a mobile phone and a tablet	3.65 m		
Persons 18 years+ undertaking select online activities via mobile phone handsets*:	Non-smartphone mobile internet users	Smartphone internet users	
> browsing websites or search for information	46%	90%	
> accessed news, sports, weather updates	40%	84%	
> used a social networking site	31%	71%	
> streaming audio or video content	19%	55%	
> paid bills	11%	38%	
> downloaded audio or video content	10%	33%	
> purchased goods or services	8%	33%	
Reasons for not going online via mobile phone handset:			
> no need	61%	41%	
> easier to use the internet via a computer than a mobile phone	37%	29%	

Note: Mobile internet subscribers include subscribers using dongles, USB modems, datacards and mobile phone handsets. m=millions.

**Relates to activities in the six months to May 2012.*

Introduction

Report 3—Smartphones and tablets: Take-up and use in Australia is the third in a series of three research reports published as part of the ACMA's *Communications report 2011–12* series. The other research reports are:

[*Report 1—Online video content services in Australia: Latest developments in the supply and use of professionally produced online video services, released on 10 October 2012*](#)

[*Report 2—Australia's progress in the digital economy: Participation, trust and confidence, released on 15 November 2012.*](#)

This suite of reports is designed to complement the ACMA *Communications report 2011–12*, which is produced to fulfil reporting obligations under section 105 of the *Telecommunications Act 1997*. These four reports make up the Communications report series.

The series aims to better inform ACMA stakeholders about convergence and the digital economy, and their impact on communications and media services and consumer behaviour. As an evidence-based regulator, the ACMA is interested in analysing the digital economy and the role digital communications and media are playing in its development.

This report provides an overview of the smartphone and tablet market in Australia from two key perspectives:

- > the supply of these services, their delivery models and products available to consumers in 2012
- > the take-up of these services in 2012, including current levels of service use, and related drivers and barriers to take-up, including the willingness to pay for these services.

The report draws on a range of sources, including annual reports, industry papers and consumer research, including an ACMA-commissioned survey conducted in May 2012, to track developments in the supply and use of smartphones and tablets.

Definitions

Cloud storage: Internet-based data storage capacity which can be purchased or is available free of charge; usually available on an as-needed basis and generally expandable as more storage capacity is required.

Data usage: Data usage includes all data transferred via uploads and downloads from a smartphone or tablet. This data may be transferred through one of a number of connections that the smartphone or tablet can utilise, including a WiFi connection or a mobile network connection supplied by a mobile network provider such as Telstra, Optus or Vodafone Hutchison Australian (VHA).

Mobile networks: Mobile networks are wireless networks which are used for communications and are capable of transmitting data over significant distances. In Australia, mobile networks are owned and operated by Telstra, Optus and VHA. Data speeds over mobile networks can vary and may be defined as 2G, 3G or 4G.

- > **2G:** Second generation mobile network (analog being the first) and first generation digital mobile network which allows download speeds roughly comparable with dial-up internet access. Users outside the range of 3G and 4G networks, but still with mobile coverage, will generally be able to transfer data at 2G speeds.
- > **3G:** Third generation mobile network which facilitates data transfer speeds faster than speeds over a 2G network. Data transfer speed over 3G networks in good coverage areas is roughly equivalent to speed over a fixed ADSL connection. Network coverage varies between providers, but Telstra's 3G network (called Next G) covers up to 99 per cent of the population.
- > **4G:** Fourth generation mobile network which facilitates data transfer speeds faster than 3G and 2G networks. Data transfer speed over 4G networks in good coverage areas is faster than speeds over a fixed ADSL connection and may be as fast as some cable internet connections. 4G coverage in Australia is currently limited to the CBD of major cities but it is expected providers will greatly expand coverage in the coming years.

Mobile apps: Mobile apps (short for applications) are software-based tools which can be downloaded and installed on a smartphone or tablet to enhance the device's functionality. A piece of software that allows a user to view their banking information on a smartphone or tablet is an example of a mobile app.

Operating system: The software that supports a computer's basic functions such as scheduling tasks, executing applications, receiving input from the user and controlling the display. In Australia, the two most common operating systems for smartphones and tablets are:

- > **iOS:** proprietary software used by Apple devices such as the iPhone and iPad. iOS content is limited to content directly supported by Apple.
- > **Android:** an open-source platform that is used by a variety of smartphone devices, including some of those manufactured by HTC, Motorola and Samsung.

Other operating systems available in Australia include:

- > **Windows, including the newly released Windows 8:** Microsoft's latest operating system, Windows 8, is now the primary operating system of Nokia smartphones and Microsoft's Surface tablet.
- > **BlackBerry OS:** operating system of the BlackBerry smartphone.
- > **Symbian:** Until 2011, Symbian was the operating system of Nokia smartphones, which have since migrated to Windows 8 as their primary operating system. It is still used as the operating system for some older model Nokia smartphones.

Smartphone: A smartphone is a mobile phone built on a mobile operating system, with more advanced computing capability and connectivity. In particular, smartphones are often characterised by the ease with which they can access information online and their ability to have their functionality expanded through custom-designed apps. Examples of smartphones include Apple iPhones, Android phones, such as HTC Desire and Samsung Galaxy, Windows mobile phones, such as the Nokia Lumia 800 and HTC Mozart, and Blackberries.

Tablet: A handheld, internet-enabled, wireless personal computer usually having a touchscreen or a digital pen-enabled interface, and no hardware keyboard. Tablets may have WiFi-only or WiFi connection plus mobile internet connectivity. Most non-iOS tablets can also connect to the internet through a USB port.

The changing communications landscape

Overview

Increasingly, Australians are identifying the mobile phone as their most-used communications device compared to the fixed-line telephone (48 per cent and 22 per cent respectively).¹ It follows that the communications market in Australia is undergoing a period of immense change and disruption, rapidly transitioning from a fixed to a mobile-dominated landscape for both voice services and internet access (Figure 1).

Ongoing competition for market share, technological innovation and the increased capacity of mobile networks have promoted the growing use of mobile networks for the delivery of internet services with:

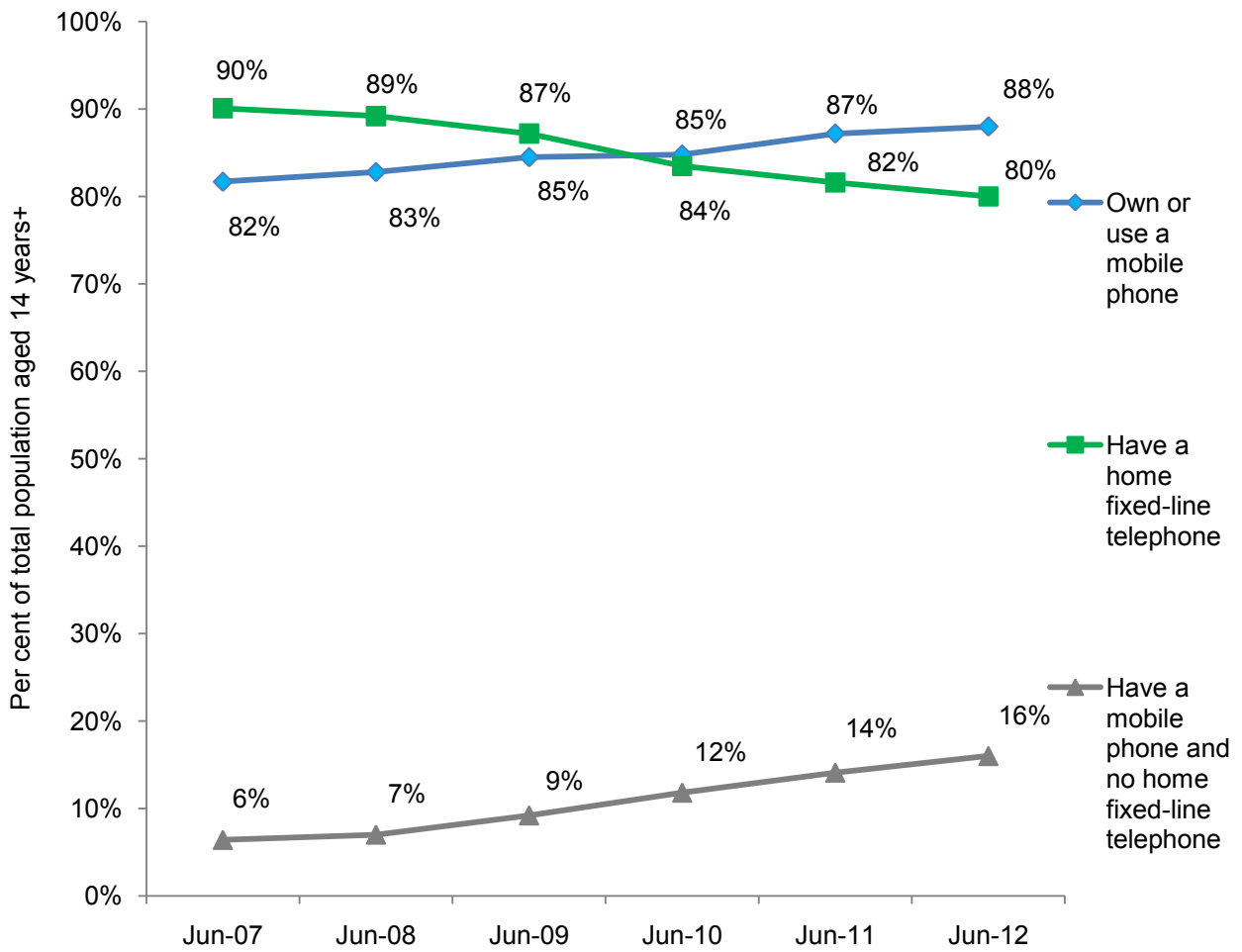
- > the number of mobile internet subscribers increasing by 22 per cent during 2011–12 to reach 22.1 million subscribers at June 2012²
- > the take-up of smartphones increasing from 25 per cent of the adult population at June 2011 to 49 per cent at May 2012³
- > diversification in the devices used to access the internet, with 9.2 million Australians going online via their mobile phone and 4.4 million accessing the internet using a tablet in the six months to May 2012.⁴

ACMA data shows that, during 2011–12, the number of mobile services in operation (SIOs) in Australia increased by just three per cent to 30.2 million services at June 2012. This was a significantly smaller increase than in 2009–10 and 2010–11, which saw mobile SIOs increase by 11 and 13 per cent respectively.⁵

While the rate of increase in mobile services declined significantly in 2011–12, the trend of customers upgrading existing mobile handsets to smartphones and acquiring tablets, along with other mobile internet services, such as dongles and datacards, has provided new growth opportunities for the mobile communications sector.

These opportunities have centred on consumers increasingly utilising online services, which in turn has resulted in higher data usage and increased engagement with the digital economy, resulting in demand for greater capacity, including through 4G network upgrades.

Figure 1 Mobile phone/fixed-line telephone adoption, Australia, June 2007 to June 2012



Base=Total population 14 years and over.

Source: Roy Morgan Single Source.

Global developments in the smartphone and tablet market

Overview

The smartphone and tablet technology marketplace is now global, with devices typically launched simultaneously across multiple countries, accompanied by worldwide marketing and, for high profile brands, multimedia events. As Australia still makes up a relatively small portion of the smartphone and tablet market, it does not have a significant impact on global trends. Rather, global developments and trends may have a strong bearing on developments and trends seen here, with pre-purchase reviews easily accessible online, apps transcending international borders and Australians keen to keep pace with the latest global trends. This section examines the latest global trends and developments to provide context for patterns observed in the marketplace for the supply of smartphones and tablets in Australia.

Global sales trends

Mobile internet access devices, such as smartphones, tablets and laptop computers, are now a primary source of internet connectivity in industrialised nations. Their adoption in less-developed regions of the world has also been rising⁶, with the release of lower-cost devices and the continued expansion of high-speed mobile networks.⁷

Across the globe, annual growth in smartphone sales of 63 per cent was recorded in the year to December 2011, compared with 11 per cent for mobile handsets generally.⁸ Tablet sales have risen even more dramatically from a lower base, increasing by 174 per cent for the year (63 million shipments, up from 23 million), compared with 2.3 per cent sales growth in the mature, desktop PC market for the same period.⁹

There is consensus among analysts that the number of smartphones in use worldwide now exceeds one billion^{10,11}, and that smartphones account for a growing proportion of mobile handset sales, estimated to be 41 per cent of all new mobile phones sold.¹² Market trends suggest that the smartphone market share will continue to rise in 2013—it is predicted to exceed half of mobile phone sales for the year—with up to a billion units sold.¹³

The popularity of mobile internet access devices has resulted in a large upswing in wireless broadband traffic. June 2012 figures released by Ericsson indicate that global data traffic in mobile networks had risen to almost 700 petabytes per month in the first quarter of 2012, more than 10 times the level of mobile data downloads recorded in the first quarter of 2009.¹⁴ This has created greater competition between carriage service providers and device manufacturers seeking to capitalise on this phenomenal growth, with both increased growth and greater competition reflected in the Australian market. While the amount of data downloaded over mobile networks in Australia has increased, it is worth noting that, in the second quarter of 2012, data downloaded over fixed-broadband connections still accounted for 94 per cent of all internet downloads in Australia.¹⁵

Market share by manufacturer

As shown in Table 2, Samsung and Apple dominated the worldwide smartphone market in the third quarter of 2012, selling in excess of 83 million units and capturing 46 per cent of the market between them. The iPhone 5 was released within only a week of the end of the quarter—21 September 2012 in Australia¹⁶—and sales of more than five million units helped buoy an otherwise declining market share.¹⁷ Samsung is

the most popular brand on the market today, accounting for well over twice the number of shipments as Apple. Shipments of ZTE smartphones, sold in Australia as Telstra-branded devices, rose by over 80 per cent from a low base. More telling is a decline of 34.7 per cent in the number of RIM smartphone shipments and a fall in HTC shipments of 42.5 per cent, the latter most likely a result of the rising popularity of alternative Android devices.

Table 2 Top five smartphone manufacturers worldwide

Device brand	Q3, 2012 market share	Q3, 2011 market share	Q3, 2012 unit shipments (m)	Q3, 2011 unit shipments (m)	Year-over-year change—shipments
Samsung	31.3%	22.7%	56.3	28.1	100.4%
Apple	15.0%	13.8%	26.9	17.1	57.3%
RIM	4.3%	9.6%	7.7	11.8	-34.7%
ZTE	4.2%	3.3%	7.5	4.1	82.9%
HTC	4.0%	10.3%	7.3	12.7	-42.5%
Others*	41.2%	40.3%	74.0	49.9	48.3%
Total	100.0%	100.0%	179.7	123.7	45.3%

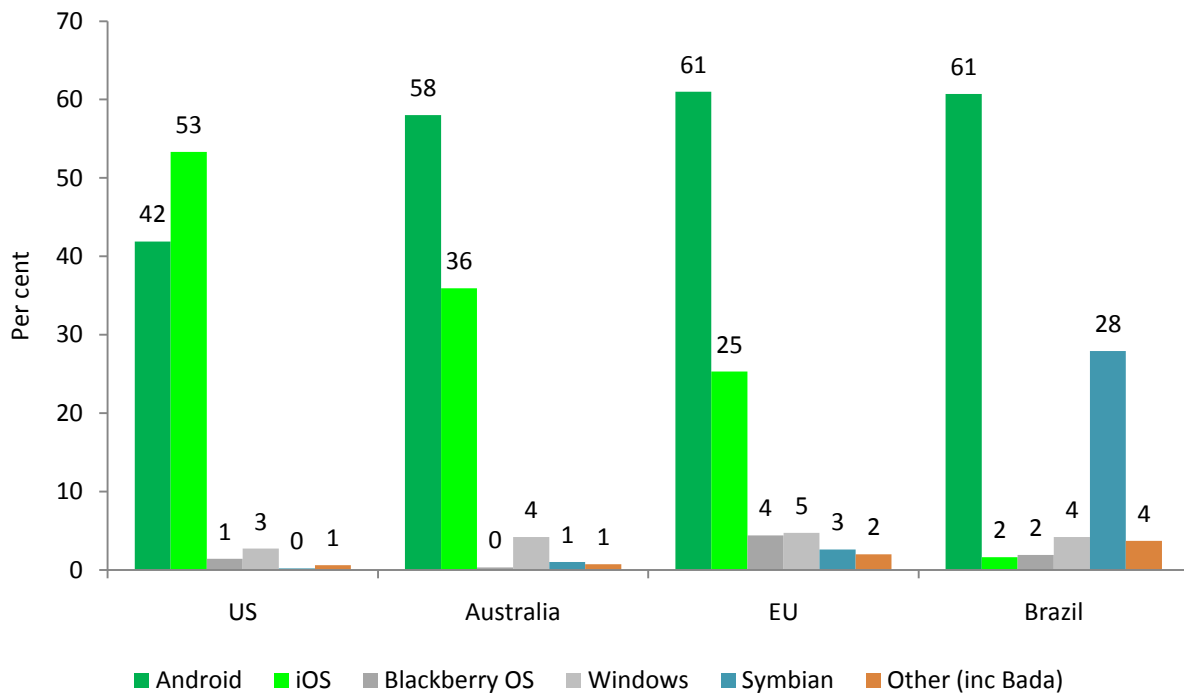
*Others include other smartphone manufacturers such as Sony, LG and Nokia.

Source: IDC Worldwide Mobile Phone Tracker, 25 October 2012.

Market share by operating system

In the EU, smartphones operating Android hold a 61 per cent market share compared with smartphones using Apple's iOS, which have 25 per cent.¹⁸ In Australia, Android phones have a 58 per cent market share compared with Apple's iOS, which has 36 per cent. However, the data indicates that the release of the iPhone 5 in late September 2012 may be a factor impinging on Android dominance.¹⁹ In the US, Apple recently achieved its highest market share accounting for 53 per cent of smartphone sales in November 2012 compared with Android devices with 42 per cent of the market.²⁰ Other platforms, such as Windows and RIM's Blackberry OS, are in single figures across Europe and North America.²¹ The Brazilian market is an interesting outlier, with Nokia's Symbian platform retaining a considerably higher market share (28 per cent) than the other countries represented in Figure 2.

Figure 2 Market share of smartphone platforms in selected countries and geographic areas



Note: EU includes France, Germany, Great Britain, Italy and Spain.

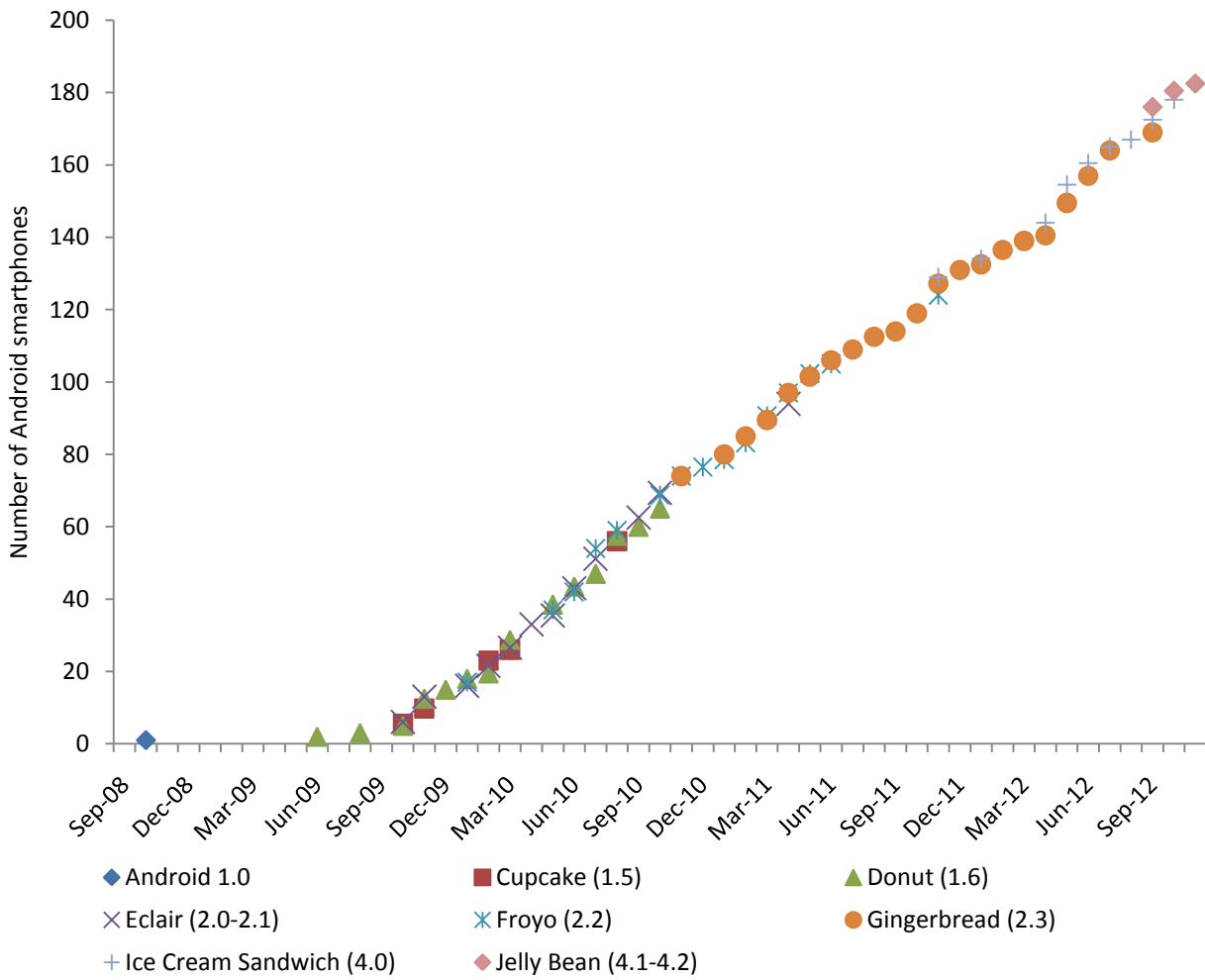
Source: Kantar World Panel ComTech, 25 November 2012 data.

Android's operating system dominance

The Android operating system, developed by Google, is based on the open source Linux operating system for PCs. Because the Android operating system is available, its licensing is relatively non-restrictive and manufacturers are able to change the system to suit their device, many manufacturers have chosen to use it. Consequently, Android smartphones dominate the market.

Released in October 2008, the T-Mobile G1 (manufactured by HTC) was the first Android device. However, the number of Android devices did not expand significantly until October and November 2009 when six phones were released.²² At the same time, Motorola released the first device with the updated Android 2.0 (Eclair) operating system, demonstrating Google's willingness to refine its software to improve useability.²³ Sales of Android phones released in this period were extremely strong with over 250,000 sold in the US the first week after release.²⁴ Since then, there has been a steady release of smartphones using various versions of the Android operating system. Figure 3 shows Android smartphones releases since 2008.

Figure 3 Android smartphone releases (worldwide) by Android version—September 2008 to November 2012



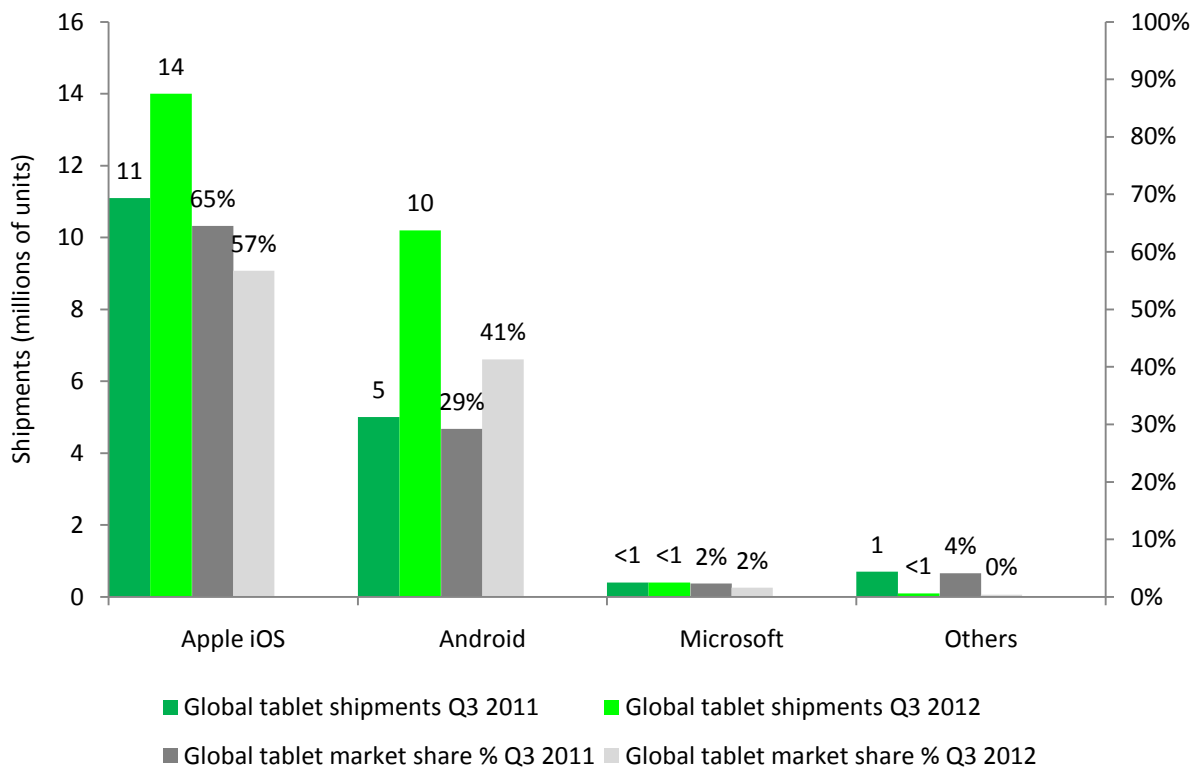
Note: The chart does not include all Android smartphones released during the period nor does it include tablets. Multiple device releases in a month may be indicated by a single marker.

Sources: CNET, Wikipedia

Tablet market share

The tablet market is also dominated by Android and iOS devices but, unlike for smartphones, Apple devices maintain a market share advantage over Android devices. As shown in Figure 4, Apple iOS devices accounted for approximately 57 per cent of the 24.7 million tablets sold worldwide in the third quarter of 2012. However, this figure has dropped from 65 per cent in the third quarter of 2011. Android tablets make up 41 per cent of the market, having risen from 29 per cent 12 months earlier.²⁵

Figure 4 Number of shipments and percentage share of total shipments for major tablet manufacturers Q3 2011 and 2012



Source: Strategy analytics.

Provision of smartphone and tablet devices and services in Australia

Mobile telephony has long been part of the Australian communications environment. However, it was the introduction of the smartphone, particularly Apple's iPhone in 2007, which revolutionised mobile phone design and catalysed industry growth and development.²⁶ This disruptive change was mirrored with the introduction of the iPad in 2010. In Australia, competitive plans, and the expansion of the smartphone and tablet market, have further encouraged consumer take-up and use of smartphone devices. In June 2012, the market was estimated to be worth over \$15 billion per annum.²⁷

Australia's smartphone and tablet market is reflective of trends in other developed countries and is currently dominated by Apple and Android devices. Sales typically surge following the release of new device models and the surrounding publicity accompanying their launch.

Smartphone and tablet supply chains in Australia

The supply chain model of smartphones and tablets is not dissimilar to that used historically in the supply of mobile phones.

Manufacturing smartphones and tablets

Device manufacturers such as Samsung, Apple and Nokia manufacture smartphones and tablets to supply to retailers for subsequent sale to consumers. As discussed previously, device manufacturers must utilise an operating system for their smartphone. Device manufacturers may either use their own designed and tested operating systems (for example, Apple uses its iOS operating system for its devices) or the manufacturer may use a third-party operating system for its devices, such as Google's Android.

Smartphone and tablet retailers

In Australia, consumers may purchase smartphones and tablets either:

- > outright through an online or physical retail outlet
- > as a bundled package with a network access plan.

Consumers who choose to purchase a smartphone or tablet outright will generally pay significantly more upfront than if they buy the device as part of a network access plan. The cost of purchasing a smartphone or tablet outright will generally depend on the features of the device, with newer devices incorporating more advanced features and usually costing more.

Consumers who buy devices bundled with a network access plan typically subscribe to a communications service for a fixed-term, usually 12 or 24 months, with minimum network access charges and, for some devices, payments are made by instalments. These plans commonly include a voice and/or data allowance which, if exceeded, can attract additional charges. This model seeks to guarantee recovery of the cost of the device and enables additional revenue via network usage charges for the term of the contract.

By enabling the consumer to pay for a device in smaller instalments, post-paid plans are regarded as having been instrumental in the development of mobile devices as affordable and functional communications technology. However, by locking consumers

into fixed-term contracts, post-paid plans may elongate the replacement purchase cycle, delaying device upgrades and potentially reducing revenue from consumers who are eager to enjoy the latest innovations.²⁸

If consumers buy their smartphone or tablet outright, they must connect to a communications service separately in order to use the device to access the internet. Generally, consumers may connect to the internet via:

- > a private internet service or a public hotspot (WiFi)
- > a post-paid subscription to a communications service through a service provider
- > a prepaid service supplied by a service provider.

Smartphone availability from major service providers in Australia

Smartphones are rapidly becoming the most commonly owned consumer electronic device in Australia. They are offered at a range of prices and functionality levels (see Table 3). Premium smartphones, such as the 4G compatible iPhone 5 and the Samsung Galaxy SIII, can be bought outright from \$788 and \$688 respectively.²⁹ They are available from the major service providers as part of a post-paid plan from approximately \$50 per month, which typically includes a voice, SMS and data service. The handsets usually come with the latest software and technological innovations, and are accompanied by multimedia marketing campaigns to ensure that they remain competitive among other similarly priced phones. Apple has been particularly aggressive in this area.

The battle for market share between Apple and Android smartphones and tablets is one that is being played out in industrialised countries across the globe. In Australia, sales of Android devices first exceeded those of the iPhone in December 2011.³⁰ In November 2012 they stood at 58 per cent to the iPhone's 36 per cent (see Figure 2). The impact of the much-anticipated arrival of the Windows 8 phones is yet to be felt, with Telstra releasing the Windows 8 Nokia Lumia 920 smartphone in late November 2012.³¹

At the lower end of the smartphone market, a number of manufacturers now offer budget versions of touchscreen devices, usually with reduced functionality or smaller screen size. For example, at the time of writing, HTC, Samsung and Nokia all offered Android smartphones for less than a quarter of the price of their top model. These have much of the functionality of more expensive devices, but a smaller internal memory and more basic operating system.

As shown in Table 3, the smartphone market has been the subject of key business partnerships that have encouraged network service providers to support specific manufacturers. Optus maintains a close relationship with Samsung, launching its 4G network and promoting Samsung's Galaxy SIII 4G model in a joint event in September 2012.³² Telstra has formed numerous business partnerships with device manufacturers, among them HTC and Nokia. The distribution rights to the Nokia Lumia, for example, have been subject to an exclusivity contract, with Telstra winning the sole sales rights for the flagship 4G model, the Lumia 920.³³ Telstra was also able to sell the Lumia 920 several weeks before the release of the Lumia 820, a smartphone with 4G capability, but with less functionality, sold by Optus and VHA.

Table 3 Selected smartphones available from major mobile network operators available to Australian consumers at January 2013

Network provider	Prepaid access	Post-paid BYOD* plan	Apple iPhone 5 Operating system – iOS Device only – from \$788 Network – 4G	Samsung Galaxy SIII Operating system – Android Device only – from \$688 Network – 4G	Blackberry Bold Touch 9900 Operating system – Blackberry OS 7 Device only – from \$499 Network – 3G	HTC One XL, SV, X Operating system – Android Device only – from \$469 (X), \$479 (SV), \$489 (XL) Network – 4G	Nokia Lumia 820, 920 Operating system – Windows 8 Device only – from \$575 (820), \$696 (920) Network: 4G
Telstra	Starter SIM card \$2 Recharge \$30–\$100 Data inclusion per recharge 400MB to 3GB Recharge expires in 30 days	12 or 24-month plan \$50–\$100 minimum per month Data inclusion 1GB to 3GB Access to best available network for handset (4G or 3G) Excess data charged at 10c/MB	\$67–\$130 minimum per month 24-month plan Data inclusion 1GB to 3GB Excess data charged 10c/MB	\$66–\$130 minimum per month 24-month plan Data inclusion 1GB to 3GB Excess data charged 10c/MB	Not currently directly available through Telstra website. Available through Telstra Shop.	HTC One XL (Telstra only) \$60–\$130 minimum per month 24-month plan Data inclusion 1GB to 3GB Excess data charged 10c/MB	Nokia 920 \$65–\$130 minimum per month 24-month plan Data inclusion 1GB to 3GB Excess data charged 10c/MB
Optus	Prepaid Starter Pack \$29.95 Recharge \$30–\$100 Data inclusion per recharge 500MB–5GB Recharge expires in 28 days	12-month plan \$20–\$70 minimum per month Data inclusion 200MB to 3GB Access to best available network for handset (4G or 3G) Excess data charged at 10c/MB–25c/MB	\$53–\$130 minimum per month 24-month plan Data inclusion 200MB to 4GB Excess data charged at 10c/MB–25c/MB	\$51–\$130 minimum per month 24-month plan Data inclusion 200MB to 4GB Excess data charged at 10c/MB–25c/MB	\$47–\$130 minimum per month 24-month plan Data inclusion 200MB to 4GB Excess data charged at 10c/MB–25c/MB	HTC One SV \$41–\$130 minimum per month 24-month plan Data inclusion 200MB to 4GB Excess data charged at 10c/MB–25c/MB	Nokia 820 \$37–\$130 minimum per month 24-month plan Data inclusion 200MB to 4GB Excess data charged at 10c/MB–25c/MB
VHA	Starter SIM card \$1 (\$31 with \$30 credit) Recharges \$10–\$70 Data inclusion 0MB to 2GB Recharge expires in 28 days	One-month plan \$20–\$85 minimum per month Data inclusion 200MB to 3GB 3G access only Excess data charged 25c/MB	\$48–\$100 minimum per month 24-month plan Data inclusion 200MB to 3GB (some plans include additional data for first 12 months) Excess data charged 25c/MB	\$56–\$100 minimum per month 24-month plan Data inclusion 200MB to 3GB (some plans include additional data for first 12 months) Excess data charged 25c/MB	Not available directly through VHA website.	HTC One x \$38–\$100 minimum per month 24-month plan Data inclusion 200MB to 3GB (some plans include additional data for first 12 months) Excess data charged 25c/MB	Nokia 820 \$37–\$100 minimum per month 24-month plan Data inclusion 200MB to 3GB (some plans include additional data for first 12 months) Excess data charged 25c/MB

*Bring your own device.

Note: Prices are subject to regular change and may not be correct at the time of viewing.

Source: Company websites.

Tablets in Australia

While versions of tablet-style computers with touchscreen hardware have been available for over ten years, it was the 2010 launch of the iPad that saw the tablet become a mass-market device in Australia and across the globe. Not surprisingly, the world's other electronics manufacturers have sought to replicate the iPad's success with their own tablets, with the result that the number of tablet devices has proliferated. According to a study by Boston Consulting, more than 100 tablets have been introduced to the market since the iPad was launched, with expected sales of 370 million units by 2015.³⁴ In Australia, Telsyte forecast that 2.37 million tablets will have been sold by the end of 2012 and, by 2016, the penetration of tablets will be comparable to current adoption levels for smartphones.³⁵

As shown in Table 4, Australian consumers have access to a range of both budget and premium tablet devices, available in screen sizes from 17.8 to 26.9 centimetres.³⁶

Connectivity

Almost all tablet models are offered with WiFi connectivity, that is, the device connects to the internet via a personal or public hotspot, or via an external modem. For an extra cost, tablets can be equipped with an internal 3G or 4G-enabled modem, providing the user with mobile network access. In July 2012, 50 per cent of tablet owners used a WiFi-only device, 47 per cent used a device with WiFi and mobile network access and the remainder had mobile-network-only devices.³⁷

With the cost of mobile data significantly higher than that for fixed data services, the way in which users choose to connect to the internet may have implications for network service provider revenues. Providers have encouraged consumers to adopt tablets with monthly data access plans. However, the proliferation of free WiFi hotspots in cafes, libraries and shopping centres across Australia, and the high use of private WiFi in homes, enables consumers, at times, to avoid using the mobile network for internet access, diminishing the network service provider–consumer relationship. Research in the United States indicates that, even with a WiFi connection and mobile network access on a single device, most consumers (90 per cent) are opting to use the device only on WiFi.³⁸ However, growing 4G network coverage, and the launch of 4G-compatible tablets in late 2012, may have a positive impact on the propensity of consumers to use mobile networks with their faster traffic speeds.

At this stage, the fixed-line networks are still used for the overwhelming percentage of data downloads.

Growth in use of WiFi hotspots

While home and work sites continue to account for the majority of internet users in Australia—15.4 million and 7.5 million respectively during the second quarter of 2012—internet use through WiFi hotspots has seen the highest proportional increases in Australia.³⁹ During the second quarter of 2012, an estimated 2.06 million Australians used WiFi internet hotspots, a 32 per cent increase in activity compared to the second quarter of 2011.⁴⁰ People aged 18–34 accounted for 45 per cent of users of WiFi hotspots, followed by those aged 35–44 at 18 per cent (Figure 5).

Table 4 Selected tablet PCs available to Australian consumers at January 2013

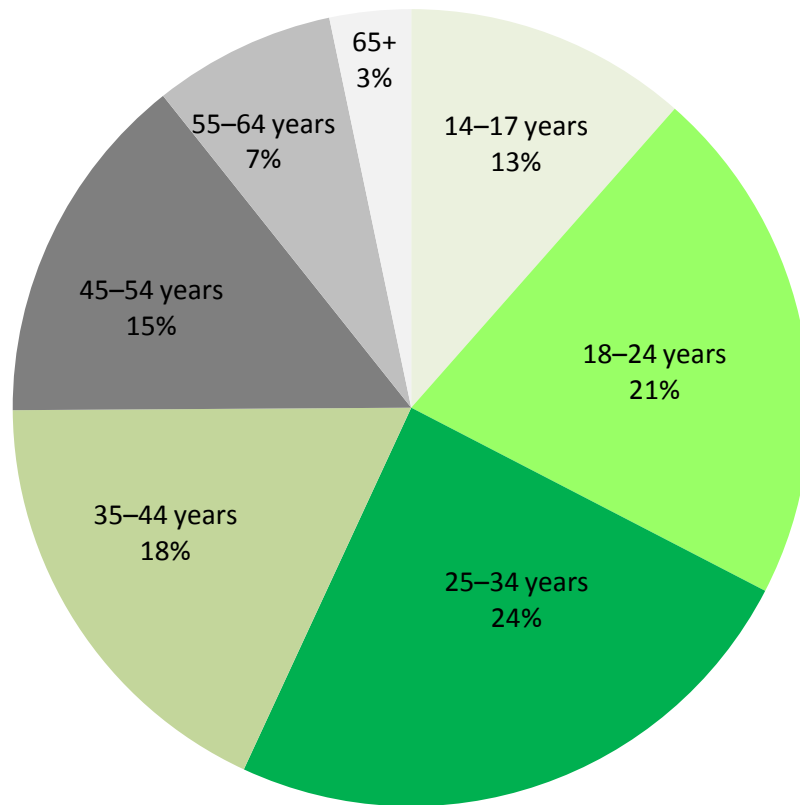
Model	Operating system	Standalone price RRP	Plan incl. tablet (over 24 mths, p/m)	Connectivity	Screen size (diagonal)	Notes/ additional functions
Apple iPad (4th generation)	iOS	(WiFi model) 16GB: \$539 32GB: \$649 64GB: \$759	Telstra: from \$49 Optus: from \$48 VHA: from \$47	WiFi-only model WiFi + 4G	24.6 centimetres	Upgraded in October 2012 to enable 4G connectivity in Australia. ⁴¹
Apple iPad mini	iOS	(WiFi model) 16GB: \$369 32GB: \$479 64GB: \$589	Telstra: from \$41 Optus: from \$41 VHA: from \$40	WiFi only model WiFi + 4G	20.1 centimetres	Launched October 2012. Two cameras.
Google Nexus 7	Android	\$249	Not available	WiFi, Bluetooth, USB Near-field communications	17.8 centimetres	Relatively inexpensive standalone price.
Samsung Galaxy Tab 2 8.9/10.1	Android	8.9 – \$599 10.1 – \$469	Telstra: from \$44 (8.9) Optus: from \$39.95 (10.1) VHA: from \$40 (10.1)	8.9: 4G, 3G, USB 10.1: 3G, WiFi, USB	25.7/22.6 centimetres	Facebook, Twitter, Google+
Microsoft Surface	Windows 8	32GB – \$559 32GB BTC – \$679 64GB BTC – \$789	Not available	WiFi, Bluetooth, USB	26.9 centimetres	Uses a cheaper ARM processor similar to mobile phones. Launched October 2012.

BTC=Black touch cover: a combined cover and keyboard.

Note: Prices are subject to regular change and may not be correct at the time of viewing.

Sources: CNET Australia, company websites.

Figure 5 Profile of users of WiFi hotspots in Australia



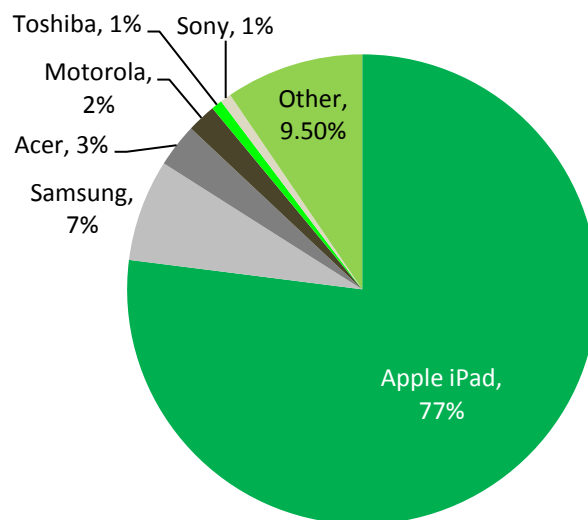
Note: Relates to smartphone users aged 14 years and over.

Source: Roy Morgan Single Source.

Device brand share and prices

Apple continues to dominate tablet ownership in Australia, with a July 2012 survey finding that over three quarters (77 per cent) of consumers who use a tablet own an iPad (Figure 6).⁴² This is a 10 percentage point increase over the year before. Other brands used by Australian consumers in July 2012 included Samsung (seven per cent), Acer (three per cent), Motorola (two per cent) and Toshiba (one per cent).

Figure 6 Brand share of existing tablets owned by Australian consumers



Source: Mackay, M., *Australian Mobile Phone Lifestyle Index, 8th Edition, September 2012.*

As consumer demand for tablets has risen, prices at the lower end of the market have become increasingly competitive, with low-end devices flooding the market. Product offerings include entry level tablets priced from \$79, though with reduced functionality, shorter battery life and a less responsive, resistive screen.⁴³

At the higher end of the tablet market, several manufacturers have released a range of tablets that are both smaller and cheaper than their full-sized models.

Miniaturisation

The recent releases of smaller screen tablets by major manufacturers indicate a shift in demand toward lighter and more portable devices, though often at the expense of processing power or pixel density. At \$170 cheaper than the equivalent capacity full-sized iPad, the iPad Mini, released in October 2012, has proven popular with consumers, with the initial stock selling out in its first weekend.⁴⁴ Other smaller tablet devices have been in high demand, including the Google Nexus. While a comparison between the take-up and use of tablets by size is yet to be completed, some analysts have suggested that the smaller tablets may 'cannibalise' sales from the full size devices, potentially reducing revenues for those who sell the larger devices.⁴⁵ Others have indicated that the smaller devices will likely occupy a different market niche, their light weight making them more suitable for use while outside the home, such as in restaurants, at the beach and other locations where a larger screen is more cumbersome.⁴⁶ This, in turn, may heighten the potential for mobile network use among tablet users.

Smartphone and tablet apps

This rise in mobile internet connectivity has led to a parallel boom in innovation and sales of software apps created specifically for smartphones and tablets. Apps enhance the operation of a smartphone or tablet by increasing its functionality and may be free or purchased. Free apps will generally include some form of advertising which provides the app developer with revenue. Purchased apps will generally be free of advertising as the app developer earns revenue through its sale.

In Australia, increasing numbers of smartphone users are downloading mobile apps, a reflection of the critical role apps are playing in making it easier for consumers to

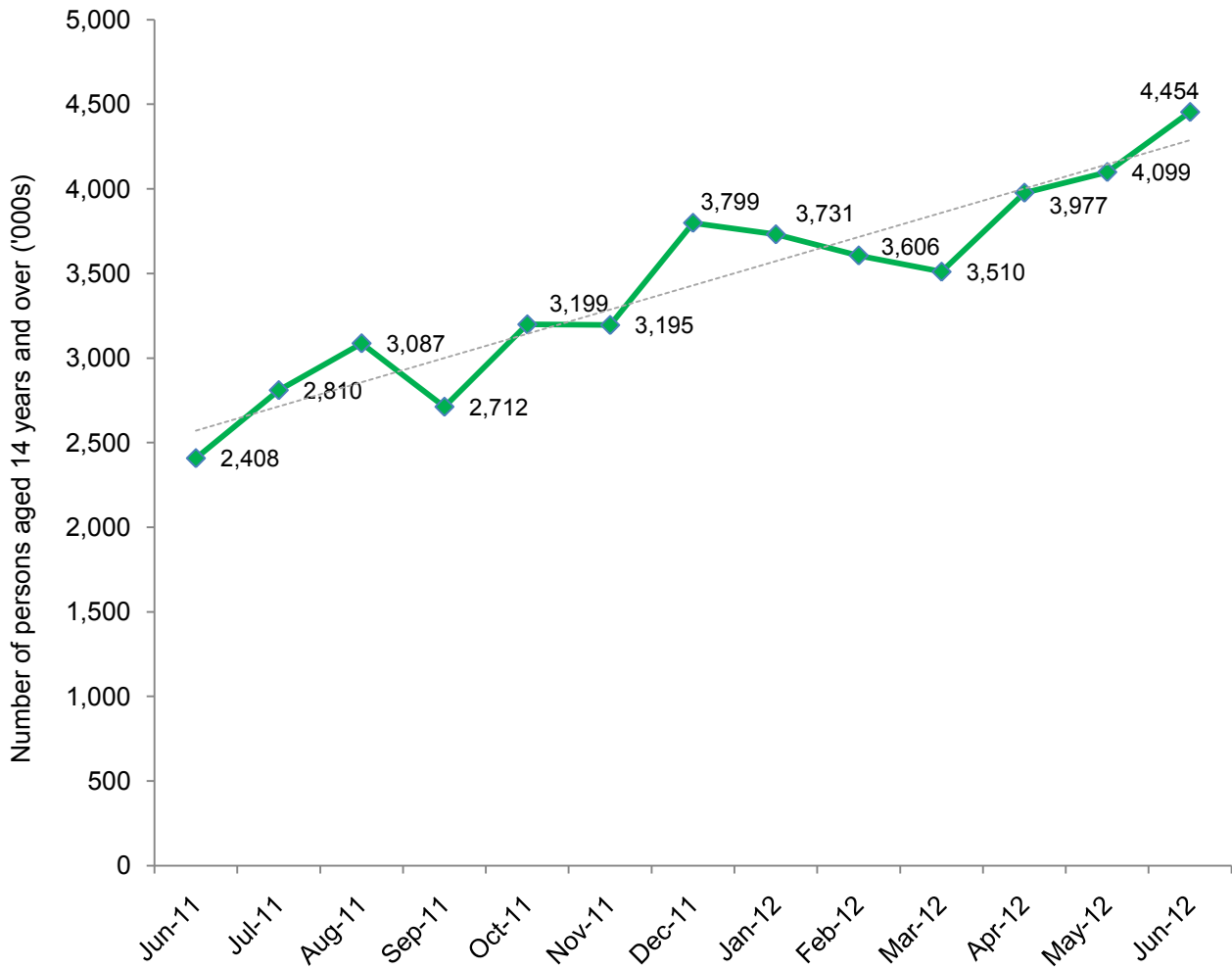
access services online via mobiles and facilitating the growth of the online economy. During June 2012, 4.45 million smartphone users aged 18 years and over downloaded a mobile app, compared with 2.41 million during June 2011—an 85 per cent increase (see Figure 7).⁴⁷

Globally, Apple reported that downloads from its App Store passed 25 billion in March 2012, while the number of Android apps downloaded reached ten billion in December 2011. One billion downloads are added to that figure each month.⁴⁸

Until recently, the number of Apple iOS apps available for download exceeded those for other platforms. However, in October 2012, the number of unique Android apps passed Apple when the number available for download from Google Play, Google's official app store for Android devices, passed 700,000.⁴⁹ Taking into account apps available for Android and third-party app stores, it is likely there are now significantly more apps available for Android than Apple's iOS.⁵⁰ This may be the result of increased popularity of devices running on the Android platform. It could also partly reflect software limitations for Apple device users who are not able to access apps from a third-party app stores unless they manually remove limitations included with Apple's iOS using a process known as 'jailbreaking'.⁵¹

This ability to access apps from a variety of sources outside the official app store may be one factor that improves the attractiveness of Android devices to potential users. However, it also increases the risk that Android devices will be exploited through malicious software and apps. In September 2012, it was reported that there may be up to 175,000 dangerous and high-risk Android apps available for download through Google Play and third-party app stores.⁵²

Figure 7 Number of smartphone users downloading mobile apps, Australia



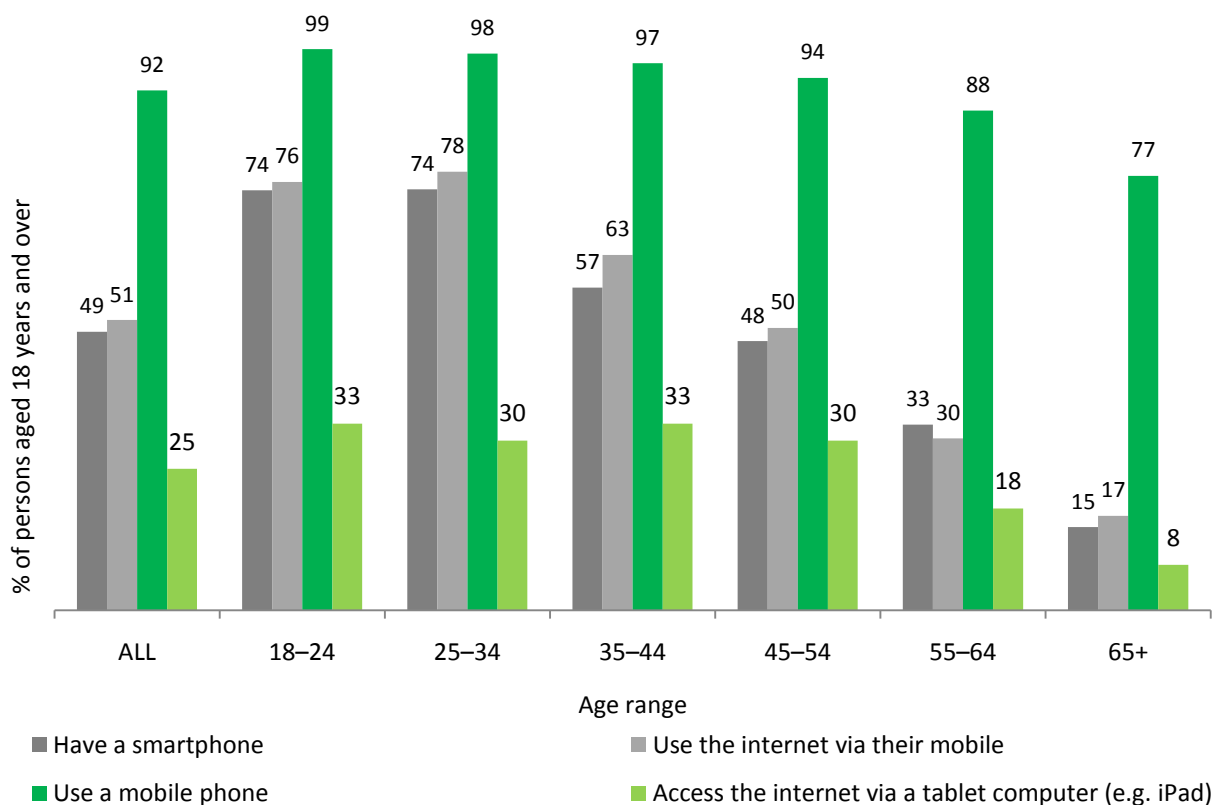
Source: Roy Morgan Single Source.

Take-up and use of smartphones and tablets

Smartphone and tablet take-up

Take-up of mobile phones in Australia appears to be reaching near saturation levels for most age groups. ACMA research shows that an estimated 92 per cent of the adult population (those aged 18 years and over) used a mobile phone at May 2012. Mobile phone usage ranged from a comparative low of 77 per cent for people aged 65 years and over to a high of 99 per cent for those aged 18–24 years.

Figure 8 Mobile phone, smartphone and tablet usage



Note: Mobile phone and tablet internet use relates to use in the six months to May 2012.

Base: Persons with a fixed-line telephone and/or a mobile telephone.

Source: ACMA-commissioned research, May 2012.

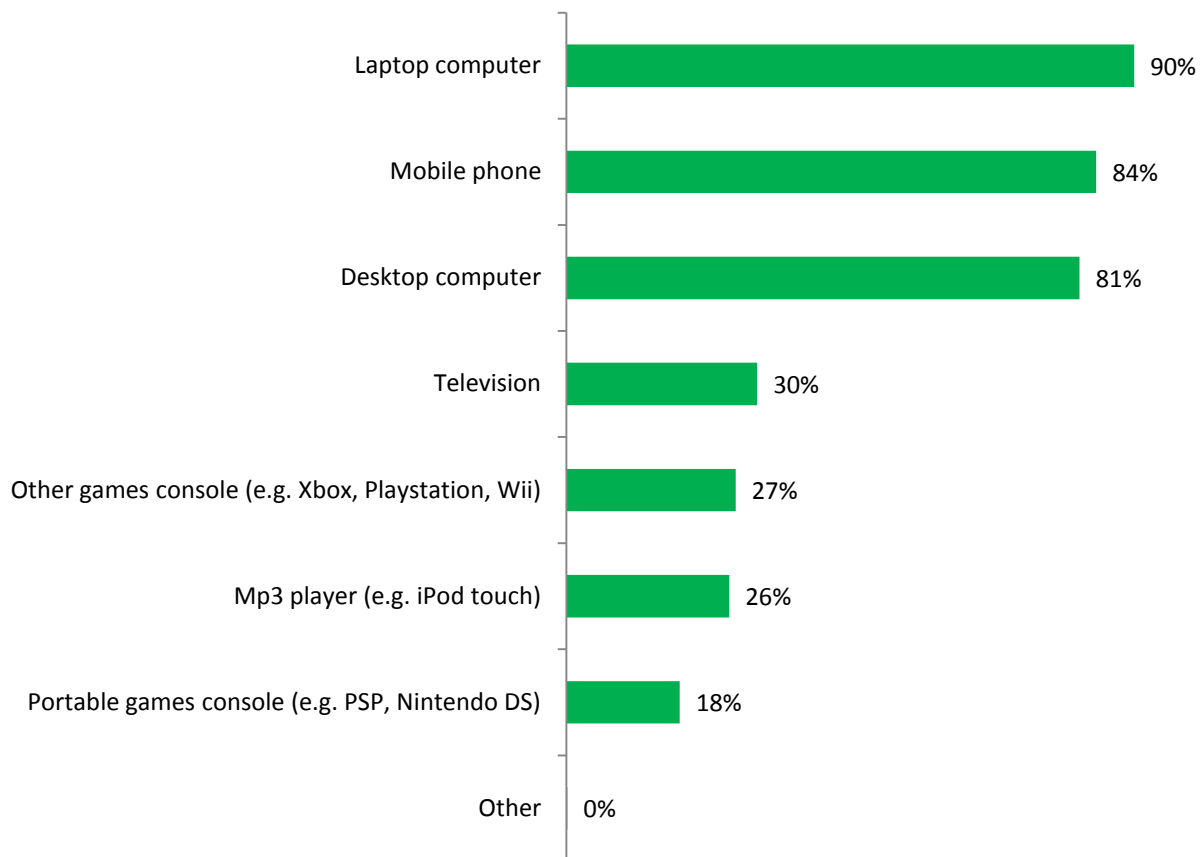
Smartphones and tablets not substituting other devices to access the internet

While consumers have been eager to take up smartphones and tablets, these devices are being used as an additional device to access the internet rather than as a substitute for other devices already used to access the internet. ACMA commissioned research (see Figure 9) found that, in the six months to May 2012, 90 per cent of tablet users surveyed also accessed the internet using a laptop computer. More than 80 per cent also accessed the internet using a desktop computer or smartphone.

Forty-nine per cent of the adult population (8.67 million people) were estimated to be using a smartphone at May 2012 compared with 25 per cent (4.25 million people) at June 2011—a 104 per cent increase. At May 2012, smartphone usage ranged from a

low of 15 per cent for people aged 65 years and over to a high of 74 per cent for those aged 18–34 years

Figure 9 Percentage of tablet users who used another device to access the internet



Note: Relates to tablet users aged 18 years and over.

Source: ACMA-commissioned research, May 2012.

Approximately 25 per cent of the adult population (4.37 million people) used a tablet such as an iPad to access the internet in the six months to May 2012. Tablet usage was highest among those aged 18–54, with usage varying between 30 and 33 per cent (see Figure 9). Time series data for tablet usage is not available.

Smartphone and tablet users are more likely to be higher income earners, reside in households with a partner and children or shared households, and live in metropolitan areas of Australia (see Table 5).

In May 2012, 3.65 million people (approximately 20 per cent of adults) used both a smartphone and a tablet.⁵³

Table 5 Demographic profile of smartphone and tablet users in Australia

	% using smartphones	% using a tablet
Income per annum		
<\$50,000	44	19
\$50,000 to less than \$100,000	62	29
\$100,000 or more	77	45
Living arrangements		
Live alone	34	10
Partner no children	47	21
Single parent	48	22
Partner and children	62	34
Shared household	69	28
Gender		
Male	54	27
Female	51	23
Location		
Metropolitan areas (capital cities)	54	28
Non-metropolitan areas	39	17

Note: Smartphone figures represents proportion of total mobile phone users whose handset is a smartphone. Tablet figures relate to the proportion of the Australian population who used a tablet to access the internet in the six months to May 2012.

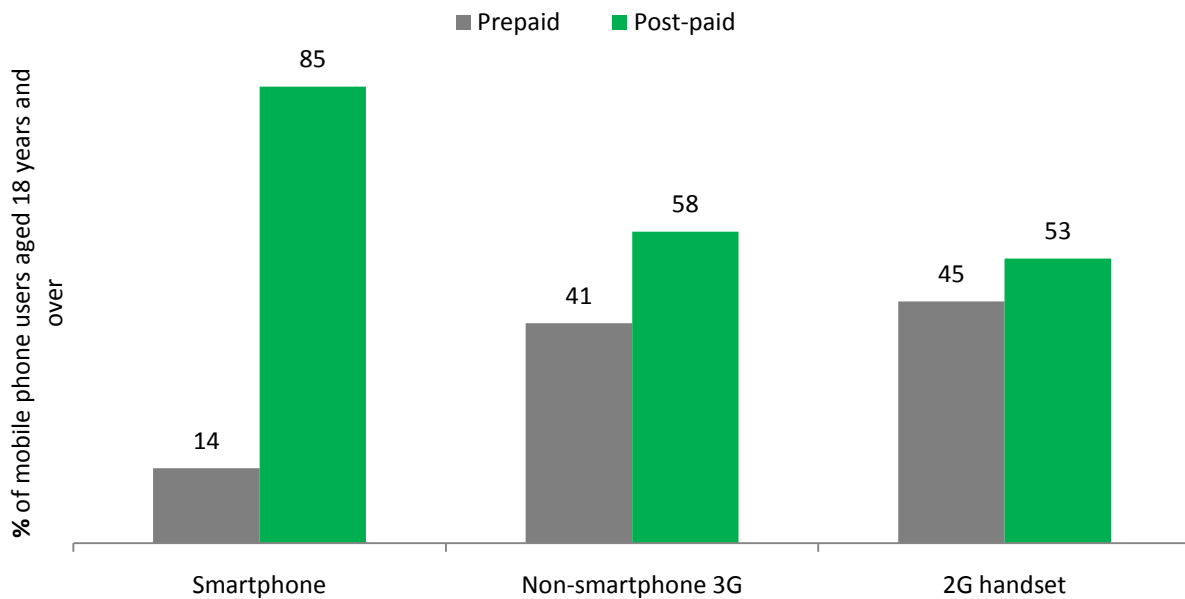
Base: Australians aged 18 years and over.

Source: ACMA-commissioned survey, May 2012

Smartphone service arrangements

Smartphone users are more likely to provide higher returns for communication services providers, than other mobile phone users. Smartphones are often only available for a substantial upfront cost or through higher cost post-paid plans (see Table 3). Additionally, smartphones generally encourage users to access the internet more often and significantly increase their data usage. In turn, this prompts users to select plans with higher data allowances, which also usually have a higher cost. As can be seen from Figure 10, the majority of smartphone users are on post-paid plans (85 per cent) compared with other mobile phone users.

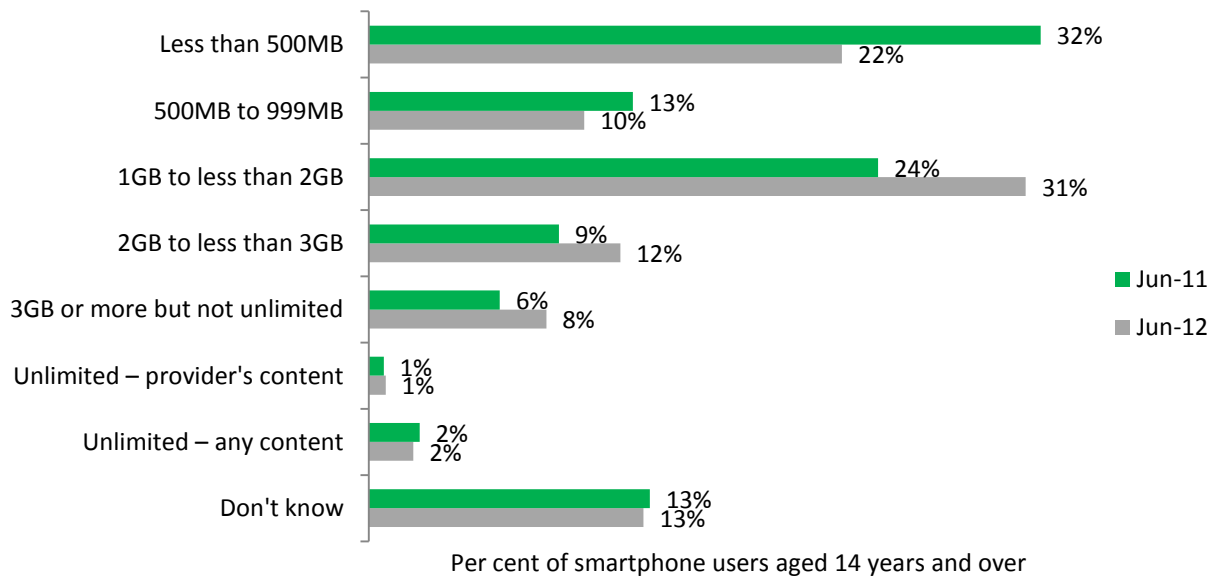
Figure 10 Consumer payment type by mobile handset device



Source: ACMA-commissioned consumer survey, May 2012.

The rapid take-up of smartphones in Australia has also been reflected in significant increases in the demand for higher mobile phone data allowances, with many smartphone consumers shifting to higher data allowances in the 12 months to June 2012. At June 2012, 54 per cent of smartphone users were on mobile phone plans with data allowances of one gigabyte or more, compared with 42 per cent at June 2011 (see Figure 11).

Figure 11 Amount of data allowance on smartphone



Note: Relates to smartphone users aged 14 years and over. Percentages may not add to 100 per cent due to rounding.

Source: Roy Morgan Single Source

The dramatic growth in smartphone take-up and increases in data download over mobile networks has also highlighted the potential for increased incidences of bill shock—a term used to describe unexpectedly high bills. Research undertaken by Macquarie University indicates that about 40 per cent of mobile phone users in Australia experienced bill shock, with excess data usage the most frequently cited reason.⁵⁴

The issue of bill shock was also of critical concern to the ACMA's *Reconnecting the Customer* public inquiry into the customer service and complaints-handling practices of Australian telecommunications providers. The inquiry found that:

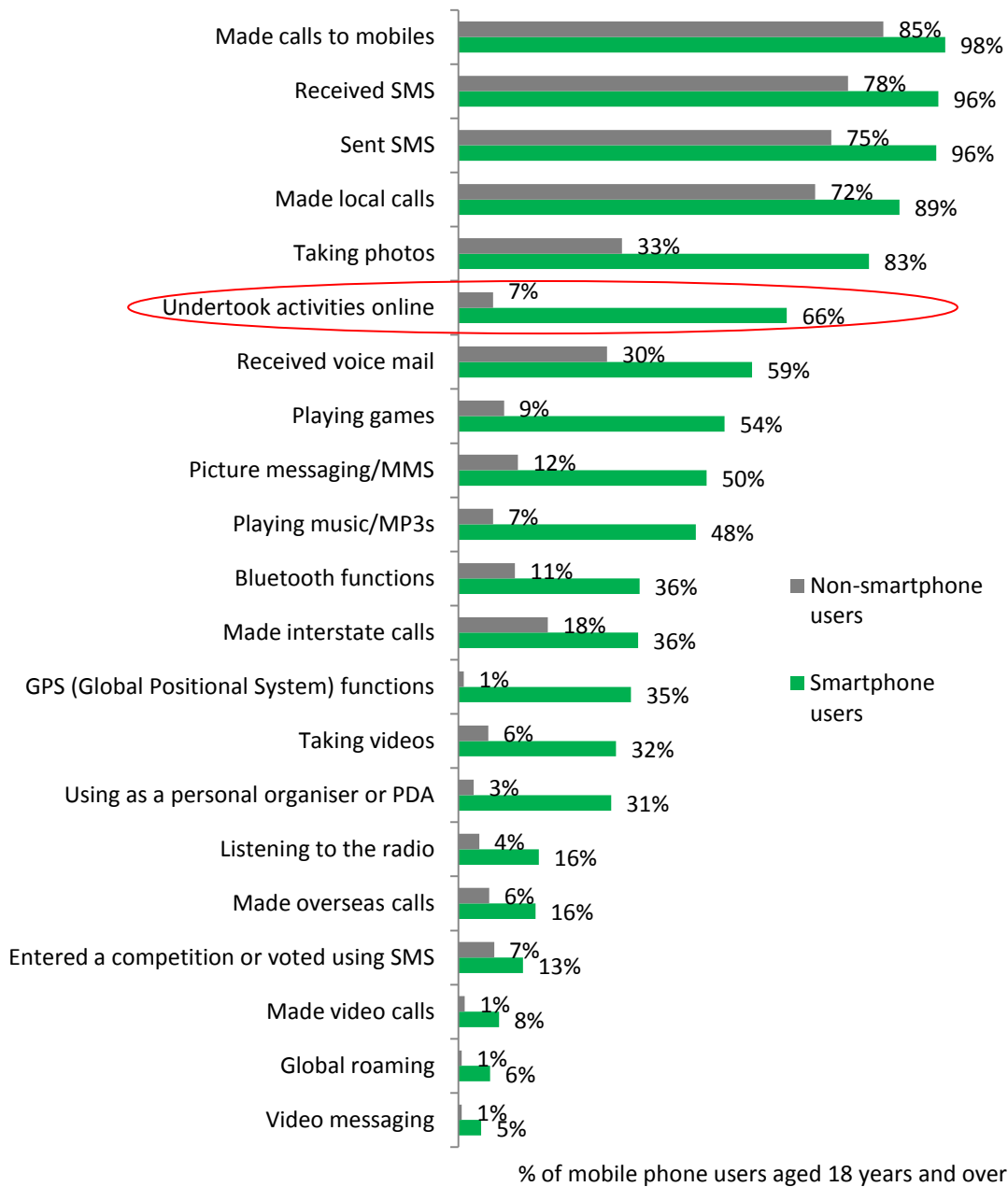
Customers frequently experience 'bill shock', which occurs when a consumer receives a higher than expected bill or sees their prepaid credit run down faster than expected. This appears to be commonly caused by either the consumer having a poor understanding of the charging arrangements for their service at the time they purchased it or because they are unable to track how charges are accumulating under a plan.⁵⁵

On 1 September 2012, the ACMA registered the new [Telecommunications Consumer Protections \(TCP\) Code](#). The TCP Code, developed by the Communications Alliance, provides improved protection for telecommunications consumers in complaints-handling, advertising, billing and financial hardship. The code applies to all carriage service providers in Australia.

Activities undertaken via mobile phones

The growth in smartphone data allowances is further reflected in the type and scope of activities performed both online and offline via these devices in Australia. Smartphone users are more likely than non-smartphone mobile users to engage in voice and data activities using their mobiles (Figure 12). This is particularly the case for online activities, with smartphone users nine times more likely to have gone online through their mobile phone handsets during June 2012, than non-smartphone mobile phone users.

Figure 12 Activities undertaken via mobile phones during June 2012 by handset type



Note: Relates to consumers in households with a fixed-line telephone service.

Source: Roy Morgan Single Source.

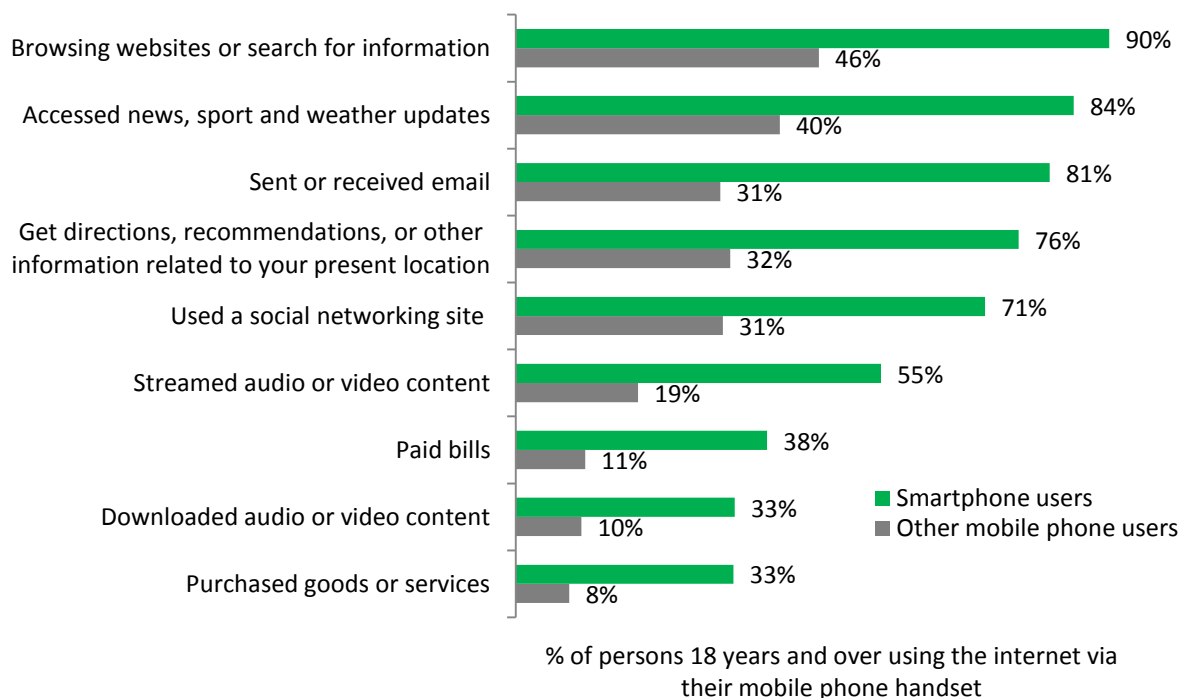
The divergence between smartphone and non-smartphone users is further demonstrated in the nature and scope of activities performed online, with smartphone users more likely than other mobile phone internet users to undertake multiple activities online (Figure 13). For example, in the six months to May 2012, smartphone internet users were:

- > four times more likely to purchase goods online than other mobile internet users
- > three times more likely to stream or download audio or video content
- > three times more likely to pay bills online
- > twice as likely to access social networking sites.

Much of this increase can be attributed to the rapid growth in smartphone adoption, with smartphone users accounting for 46 per cent of mobile phone users at June 2012, up from 28 per cent at June 2011.⁵⁶ This increase in adoption, and the higher level of activities undertaken online by smartphone users compared to non-smartphone users, may be further attributed to tech-savvy users moving to smartphones because these devices provide better access to online services. In turn, smartphones themselves are attracting new users due to their increased functionality and ease of use.

While mobile phone handset internet use has seen dramatic growth in Australia, the volume of data downloaded via mobile phone handsets accounted for less than two per cent of total data downloads in Australia in the three months to June 2012.⁵⁷ This may reflect the fact that, while the number of persons with a smartphone has increased significantly over recent years, nearly 57 per cent of smartphone users also have a fixed-line broadband service at home, which they are likely to use to access high-bandwidth services.⁵⁸

Figure 13 Activities undertaken online via mobile phones by handset type



Note: Relates to consumers in households with a fixed-line telephone service. Relates to online activities undertaken in the six months to May 2012.

Source: ACMA-commissioned consumer survey, May 2012.

Reasons for not using mobile handsets for internet access

Significant numbers of Australians have not used the internet using their mobiles and are unlikely to do so in the short term, despite the growing focus on the development of internet services targeting mobile phone users.

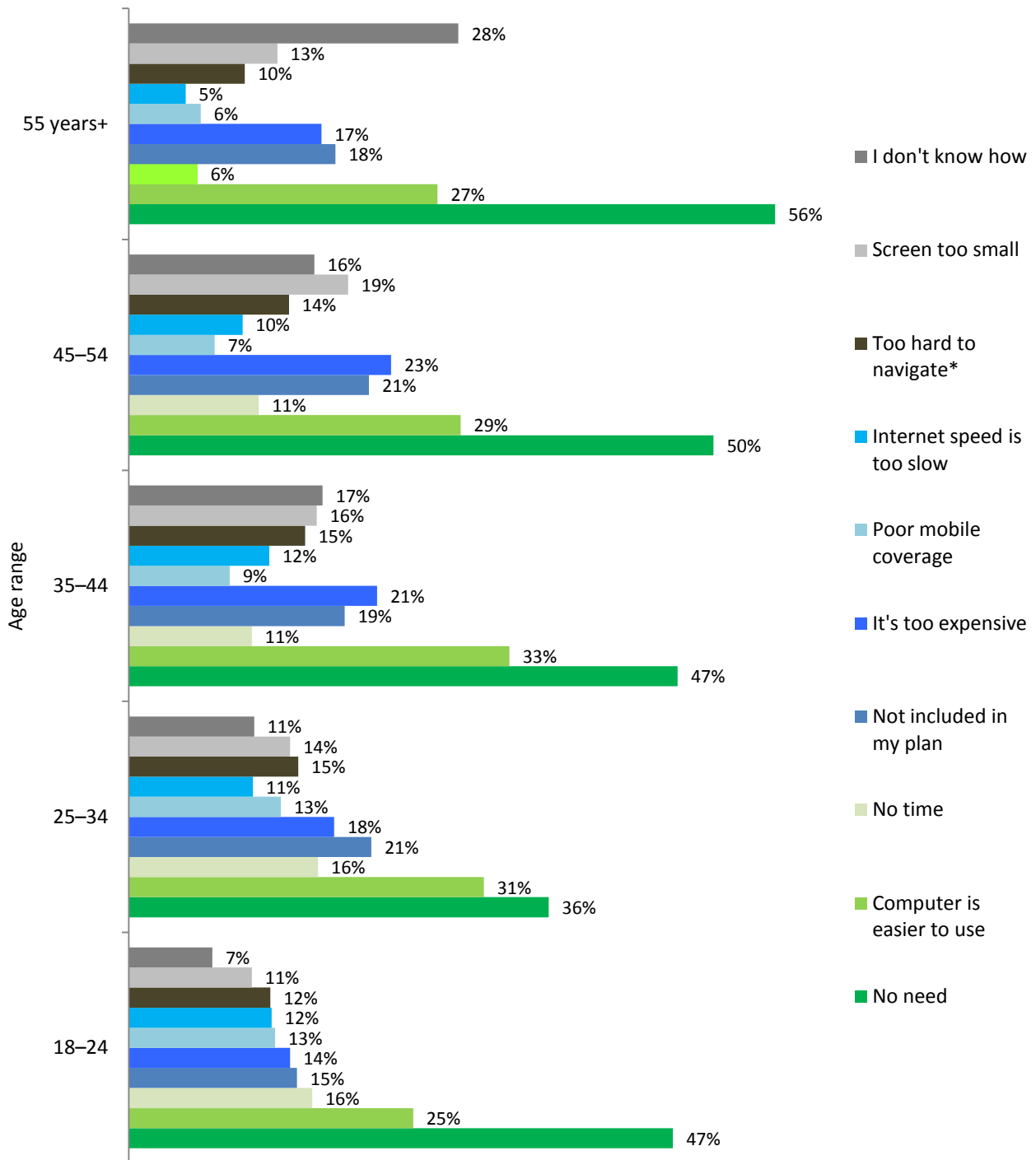
ACMA research (Figure 14) shows that consumers most frequently identified factors associated with need, useability and cost as reasons for not using the internet through their mobile phones.

Reasons for not using a mobile phone to access the internet were generally consistent across all age groups, although a higher proportion of persons aged 55 years and over also said that they did not know how to access the internet from their mobile phone.

These factors were dominant regardless of handset type. Of Australians not using the internet via their mobile phones:

- > 41 per cent of smartphone users reported no need to use the internet using their mobile, compared to 61 per cent for other mobile phone users
- > 29 per cent of smartphone users reported that it was easier to use the internet through a computer than a mobile phone, compared to 37 per cent for other mobile phone users.

Figure 14 Reasons for not using internet via mobile phone



% of persons not using the internet via their mobile phone in the six months to May 2012

Note: Between two and seven per cent of non-mobile-phone internet users reported their phone was not internet enabled. Multiple responses allowed.

*It is too hard to navigate around internet using buttons on a mobile phone.

Source: ACMA-commissioned consumer survey, May 2012.

The future of handheld smart devices in Australia

New smart devices

The release of the iPhone 5 showed that the launch of new smart devices can stimulate the take-up of handheld communications devices. Manufacturers are consistently looking to gain a competitive edge by increasing the functionality and capability of their device. For example, both Samsung and Apple are predicted to release new versions of their current flagship smartphones in 2013, with Samsung developing its Galaxy S4 and Apple rumoured to be developing the iPhone 5S. Both phones are expected to include powerful upgrades to current models to create consumer interest and generate strong sales.⁵⁹ Some features that are forecast to be included in new high-end smartphones include larger 12.7 centimetre screens and screens with improved resolution.⁶⁰

Other manufacturers have also announced new devices scheduled for release in early 2013. These include:

- > RIM's (creator of Blackberry) Blackberry 10 smartphone which will include software changes to improve useability. Some versions of the device will include a full touch screen similar to other popular smartphones.⁶¹
- > Microsoft's Surface tablet with Windows 8 Pro.⁶² In addition, Microsoft will continue seeking greater market share for its smartphone operating system through its agreement with smartphone manufacturer Nokia.

Emerging services

In addition to continued innovation in smartphone and tablet functionality and useability, there have been parallel developments relating to the services accessible through these devices. Some key developments are explored in this section of the report.

Mobile payments and mobile wallets

A variety of factors are driving the push to mobile payments. Banks and credit card companies are in favour of the additional security features embedded in new payment technologies, while retailers and consumers are attracted by the fact that goods and services can be paid for quickly, securely and easily.

The digital wallet has emerged as an increasingly popular method for consumers to pay for goods and services. The wallet may contain a consumer's bank and credit card details, as well as other important information, such as a driver's licence and Medicare or health insurance details.

An account with an organisation such as PayPal is an example of a digital wallet. Consumers who have accounts with PayPal provide banking and credit card details to the organisation.⁶³ They are then able to use the account to pay for goods and services, primarily purchased over the internet. PayPal pays the merchant and debits funds from the consumer's preferred account. This process eliminates the need for the consumer to provide banking details directly to the merchant. PayPal is also beginning to be used for non-internet transactions. For example, a Sydney taxi-booking service app allows customers to pay fares using a smartphone. PayPal reported that it had three million active accounts in Australia in 2010)⁶⁴ and expects to make mobile payments worth over \$10 billion this year.⁶⁵

Google and Apple have also introduced new products aimed at further expanding the use of digital wallets by consumers. Apple launched its new Passbook feature with the recent release of iOS 6 and Google has released Google Wallet. Apple's Passbook is an app-style service that is primarily designed to facilitate ease of access to tickets and vouchers on a consumer's iPhone. For example, if a consumer buys an airline ticket with a partner airline that utilises Passbook, the ticket will appear in Passbook on the consumer's iPhone. When boarding the flight, the consumer then only needs to scan the flight boarding pass that is stored on the phone.⁶⁶ Recently, Apple and Qantas jointly announced that iPhone users are now able to use Passbook for boarding Qantas domestic flights.⁶⁷ The Passbook service can also be used for 'customer loyalty', such a coffee store offerings. It is also envisaged that consumers will be able to purchase music through Passbook, with charges made to their iTunes Store account. At present, the service can also be used to make purchases from Apple retail outlets.⁶⁸

The Google Wallet service is currently only available in the US for use with a small number of near-field, communication-enabled smartphones.⁶⁹ Google Wallet can be used to store a user's bank account and credit card details securely and remotely. The service allows users to pay for goods and services using their Android device (with near-field communication capability) by tapping the device on a point-of-sale terminal to complete a transaction.⁷⁰ This service, in its current format, is limited to devices that are capable of near-field communications. However, Google has indicated that it will shortly be introducing the 'Google Wallet Card' which will allow users with Android phones, that are not enabled for near-field communications, to use the Google Wallet service for purchases.⁷¹

Mobile computing and the cloud

Mobile cloud services are online data-storing services accessible from a smartphone where most of the data (including user files) is stored remotely and subsequently accessible on demand via the internet. The advantage of cloud services are that they do not require users to utilise storage space on their device and that content stored in the cloud can then be accessed from a number of devices, such as the user's PC, tablet and smartphone. The provision of cloud services is also attractive to service providers because it provides an opportunity to develop an additional revenue stream.

In the six months to May 2012, 71 per cent of the adult population in Australia used a cloud service.⁷² Table 6 shows the percentage of cloud service users who undertook various cloud service activities, disaggregated by age group.

Table 6 Type of cloud activities undertaken as a percentage of internet users who use cloud services

Type of cloud computing activities undertaken	Age group					Total
	18–24	25–34	35–44	45–54	55–64	
Used webmail services	98	95	86	80	74	85
Stored photos online	60	65	49	53	51	56
Used applications such as Google Drive or Adobe Photoshop Express	46	48	47	52	52	49
Stored personal video online	18	20	15	12	11	15
Paid to store computer files online	8	11	12	11	6	9
Backed up a hard drive to an online site	5	12	10	13	10	10

Note: Figures relate to cloud activities undertaken via any device.

Base: Australians aged 18 years and over with a home, fixed-line telephone or mobile phone.

Source: ACMA-commissioned survey, May 2012

Given the rapid growth in mobile phone internet activities, it can be assumed mobile cloud services will also increasingly feature in the online activity profiles of mobile phone internet users. For example, 63 per cent of mobile phone internet accessed a social network site in the six months to May 2012.⁷³

Mobile cloud service providers

Google and Apple are two major technology providers that currently offer users access to mobile cloud services. Apple's iCloud service allows users to access music, photos, calendars, contacts and documents from any Apple device linked to their account.⁷⁴ In July 2012, it was reported that Apple had 150 million iCloud users with this number expected to grow with further integration of the iCloud service into new Apple devices.⁷⁵ Google Drive is Google's cloud service. It is similar to Apple's iCloud in that users are able to store files remotely, with an added emphasis on sharing data and information and remote collaboration. Google Drive users are able to share files with anyone, including allowing multiple users to access the same file at once.⁷⁶ Apple's iCloud is much more restrictive in terms of sharing with how and what users share being closely controlled.⁷⁷ Both services provide users with 5GB of storage for free. Additional storage space is available to buy, if required.

Optus' Smart Safe product is a cloud storage utility available to Optus customers. Users are able to access 2GB of storage for free, with additional amounts (20GB and 300GB) available for a monthly fee.⁷⁸ Telstra and VHA do not currently offer their own consumer cloud storage service, but either recommend or provide users with access to a third-party cloud storage service.

While established providers of services for mobile are moving into providing cloud services, new service providers have established themselves as suppliers of cloud services as their primary business. Dropbox commenced in 2007 as a file-hosting service and in November 2012 announced that it had over 100 million users.⁷⁹ Dropbox, like other cloud services, allows users to share files with others and between their PCs and devices. Smartphones and tablets are able to access the service via an app. And, like other services, Dropbox provides 2GB of storage for free with users able to purchase additional storage.

Near-field communications using smartphones

Near-field communications is a technology that allows smartphones and other communications devices to communicate with each other by either touching the devices together or holding the devices within a short distance of one another. The use of near-field communications for mobile devices is still in its infancy in Australia but it is expected that, like ATMs and EFTPOS, Australia will adopt this technology rapidly in the coming years.⁸⁰ Currently, a quarter of consumers find the prospect of making payments via a smartphone with in-built, near-field communications capabilities appealing.⁸¹ At this time, relatively few retailers and organisations have adopted near-field communications for mobile devices. Some of the early implementations include the Commonwealth Bank's Kaching iPhone app⁸² while other large organisations, such as Coles, Woolworths and Telstra, are running trials of the technology's functionality.⁸³

The obvious aim of the implementation of near-field communications is to allow ease of access to information and the processing of transactions. While currently using a near-field communications app may appear cumbersome, it is not too difficult to see the potential benefits of contactless payment mechanisms. As part of its program to trial new payment technologies, Woolworths found that it took on average 6.4 seconds to process a contactless payment compared with 30.6 seconds for a traditional payment.⁸⁴

Payments are not the only functionality for which near-field communications are being utilised. Like quick response (QR) codes discussed below, companies are using small sticker-type markings to show consumers where they are able to tap their near-field communications enabled device to interact with their environment. In the Sydney area of Surry Hills, Tapit Media has placed Tapit stickers at a number of restaurants. The stickers can be used by consumers for a range of functions including viewing a menu, seeing the day's specials or 'liking' or 'checking-in' to the restaurant on Facebook.⁸⁵

For contactless payments to become the new norm for paying for goods and services, it will be not only necessary for retailers to adopt the technology on a large scale, but it will also be necessary for the consumer to have a device that is capable of making contactless payments. Current iPhone models (including the new iPhone 5) do not include near-field communications functionality.⁸⁶ Some industry stakeholders, such as PayPal president, David Marcus, predict that the technology will fail to take hold as it is debatable how much easier it is to pay with a phone over a card.⁸⁷ However, recent announcements suggest that the widespread adoption of near-field communications as a payment option may not be too far away. Some new devices (including Samsung's Galaxy S3 and Nexus) incorporate near-field communications functionality. Also, VHA announced recently that it would commence a new mobile payments system—in partnership with Visa and ANZ bank—in 2013 and that near-field communications capabilities will be included with 80 per cent of the phones it sells during the year.⁸⁸

QR codes

QR (quick response) codes are patterns of small black squares arranged on a white background. They work like barcodes and their use is popular in some areas because they can store a greater amount of data than standard barcodes.⁸⁹ The use of QR codes has increased in Australia due to growth in the number of Australians with smartphones capable of reading QR codes. Approximately three per cent of mobile phone users in Australia (480,000) were estimated to have used a QR code reader via their mobile phone during June 2012.⁹⁰ While the use of QR codes is not widespread in Australia, the most predominant use to date has been through print advertising. The benefit of using these codes in print advertising is that it allows consumers to quickly visit a website linked to an advertisement.

Infrastructure developments—4G

As outlined in a number of recent reports by the ACMA, the increased popularity of wireless internet access in Australia is likely to continue with the rollout of new, user-friendly devices, higher data speeds and generous data plans.⁹¹

Wireless service speeds are increasing, with the 4G network delivering internet download and streaming speeds that are up to 25 times faster than those offered by 3G services when they were launched.⁹² Pioneered in Australia by Telstra, 4G services are now being offered by other providers, including Optus and iiNet, which sells services over the Optus network.^{93,94} VHA has announced plans to roll out a 4G network in 2013 but has not yet outlined any definite rollout timings.⁹⁵ While 4G coverage in Australia is currently restricted to metropolitan areas and a few regional centres, Telsyte has forecast that there will be almost seven million 4G connections by 2016, accounting for 19 per cent of the market.⁹⁶

The adoption of 4G technology by Australian consumers is likely to encourage the take-up of services such as mobile television, especially longer, high-definition films and television series. It is also likely that, with the continued rollout of 4G services, the capacity for providers to offer live events to mobile audiences will increase, enabling consumers to view live concerts, sport or newscasts whenever or wherever it is convenient.⁹⁷

Market challenges

Telecommunications service providers in Australia face potential challenges which threaten to erode traditional revenue streams based on the widespread adoption of the mobile phone. Mobile network operators earn significant revenue from users sending SMS messages and making phone calls carried over a mobile network. To date, Australian consumers have made extensive use of these services. In June 2012, the percentage of Australians mobile phone users (aged 14 and over) sending 50 or more SMSs per week increased 2.1 percentage points to 18.1 per cent while the percentage sending fewer than five SMSs per week declined 2.2 percentage points to 23.2 per cent, compared with the same period in 2011.⁹⁸ Overall, Telstra reported a 21.6 per cent increase in the number of SMSs sent in 2011–12, compared with the previous year.⁹⁹

While consumers may be currently making more use of these services, this increase has not necessarily been reflected in revenue increases for providers. Increased competition has forced them to lower prices and include more in service offerings to entice consumers. The result is some providers reporting a reduction in average revenue per user (ARPU) which impacts on profitability. Optus reported that its mobile ARPU declined by \$2 to \$45 in 2011–12.¹⁰⁰ Telstra said its mobile ARPU dropped by \$2.44 in the year to June 2012 and fell by \$4.28 in the six months to June 2012.¹⁰¹

Faced with declining ARPU figures, providers have looked to increase prices for some services while offering fewer inclusions for others. In some cases, they have reduced the amount of data included with some service plans while in other cases, the prices of plans have increased and some smaller and cheaper plans have been removed altogether.¹⁰² For example, Telstra announced in July 2012 that it would no longer offer its cheapest post-paid mobile plan (\$29 per month).¹⁰³ In addition, Optus' \$80 plan currently offers half the data allowance (2GB per month) of its \$79 plan, which was available in 2011.¹⁰⁴

Declining revenues have also given providers a strong incentive to expand further into data and content services.¹⁰⁵ Providers have developed several strategies to encourage demand for data and content services, including providing broadband-speed internet access to mobile devices, and access to popular content.¹⁰⁶ Non-messaging data services made up an estimated 28 per cent of mobile revenues in the

2010–11 financial year¹⁰⁷, with these services expected to drive revenue for the five years until 2016–17.¹⁰⁸

Over-the-top services

The introduction of over-the-top (OTT) phone call and messaging services that utilise a smartphone's data connection further threaten provider revenue. Ovum recently predicted that OTT services such as VoIP will cost the global telecommunications industry \$479 billion in lost cumulative revenues by 2020.¹⁰⁹ It was also reported that the number of SMSs sent in the US during the September 2012 quarter declined for the first time—a consequence of increased use of mobile internet protocol services.¹¹⁰

OTT services are generally available for use on a smartphone through an app. These services can be beneficial to the consumer in situations where calls may have traditionally been quite expensive, such as international calls, or where a user would like to send a large number of messages. A VoIP service, such as Skype, allows users to complete video and voice calls to other Skype users via an internet connection, bypassing the need for the call to be carried over the voice communications channels of a mobile network. Skype calls between users are free and they only need to pay for their internet connection. While Skype has been available for some time for use on a PC as a replacement for a fixed-line voice service, it is now available as an app on mobile devices.

A service such as Skype also threatens traditional revenue streams as users are able to buy credits to call mobiles and landlines worldwide, often at prices much lower than those offered by established telecommunications providers.¹¹¹ Skype looks set to attempt to push further into Australia with a recent announcement that it will sell prepaid cards with credit for the service in up to 10,000 retail and convenience store outlets across Australia by March 2013.¹¹² In Australia, there were an estimated 616,000 mobile phone VoIP users at June 2012, an increase of 133 per cent since June 2011.¹¹³

Non-SMS messaging

Mobile network operators are also at risk of losing SMS revenue as consumers switch to alternative methods of sending text-based messages. Facebook users have been able to send messages using the social networking service since its early days. However, Facebook has recently introduced smartphone apps which aim to improve a user's experience when sending Facebook messages. The apps are available for iOS, Android and RIM's Blackberry OS operating systems. They incorporate real-time alerts for incoming messages and an interface that is similar to the in-built messaging app on smartphones.¹¹⁴ The Google Play store indicates that there have been more than 50 million downloads of the Facebook Messenger Android app.¹¹⁵

Apple has also introduced its own data-based OTT messaging system for iOS devices that allows users to send free text messages to other users with iOS devices over an internet connection. Users are able to send messages based on their Apple account ID to and from devices that do not have a phone number or access to a mobile phone network but do have access to the internet.¹¹⁶

Smartphones and tablets as assistive technology

While developments in the smartphone and tablet market have largely focused on commercial applications, these devices are also being touted as having the potential to improve access to information and services for people with a disability. The principle of equivalence is being reflected around the world through service trends and approaches to accessibility being adopted by government agencies.

According to the United Nations, approximately 10 per cent of the world's population—650 million people—live with some form of disability, such as vision, hearing, physical, mental or intellectual impairment. Australia also has an ageing population that will increasingly have eyesight, hearing and mobility problems.

In Australia, accessibility measures are underpinned by the *Disability Discrimination Act 1992*, which has led to improved website, telecommunications, broadcasting and financial services accessibility. A report, *Measuring Progress of eAccessibility in Europe*, commissioned by the European Commission, included survey data from Australia rating it well above the European average.¹¹⁷ The Department of Broadband, Communications and the Digital Economy (DBCDE) has sponsored trials to evaluate and demonstrate telecommunications technologies that can provide accessible options to the elderly and disabled, by employing IP-based services to remotely support specific disability groups.¹¹⁸ DBCDE has also examined accessibility issues by completing the *Review of Access to Telecommunications Services by People with Disability, Older Australians and People Experiencing Illness*, which was released in July 2012. One recommendation of the review aims to improve the information available to people with a disability to support them in making use of general telecommunications consumer products and services with accessibility features.¹¹⁹

People with a disability or communications impairment can use a smartphone or tablet to download a range of apps. They can also take advantage of built-in features to help them with a wide range of communications, e-commerce and navigation, as well as to support many day-to-day activities that other people take for granted. This includes using SMS and instant messaging apps, such as Google Translate, to translate a message into another language, and GPS paired with voice navigation apps.¹²⁰

The vision-impaired can use apps on these devices to scan currency and read barcodes.¹²¹ One such device has a large touchscreen interface, providing a completely accessible system from which to navigate and communicate more easily.¹²² According to Media Access Australia, the blind and vision-impaired community recognises the Apple iPhone as the most accessible smartphone, given that it includes accessibility features like a sophisticated screen reader, full-screen magnifier and white-on-black display for higher contrast.¹²³ The user can scan their finger across the audible touchscreen and simultaneously tap with another finger to enter a character or select an object; while the GPS-enabled navigation app features speech directions, as well as reading out street and business names or landmarks.¹²⁴

The combination of these technologies found in smartphones and tablets provides access to mainstream services and can be easier to use than the highly specialised legacy equipment.¹²⁵

Research methodology

Overview of research resources

The data used in this report is drawn from a number of research sources including the following.

ACMA-commissioned consumer research in the form of a telephone survey conducted in May 2012. Undertaken by Roy Morgan Research, the survey sampled 2,205 adult respondents aged 18 and over, comprising 1,800 with a home fixed-line telephone and 400 with a mobile phone and no home fixed-line telephone (mobile-only users)—see Table 7. The survey asked respondents questions regarding their telecommunications service use in the six months to May 2012.

Table 7 ACMA-commissioned consumer survey sample breakdown (unweighted)

	Sample size	
Gender	Male	1,102
	Female	1,103
	Total	2,205
Age	18–24 years	258
	25–34	370
	35–44	397
	45–54	398
	55–64	357
	65 and over	425
	Total	2,205
State	NSW/ACT	722
	Vic.	562
	Qld	437
	WA	242
	S/NT	189
	Tas.	53
	Total	2,205
Location	Metropolitan	1,518
	Regional	687
	Total	2,205

Roy Morgan Single Source, June 2012, for additional estimates relating to the population in Australia 14 years and over, and Australians 18+, drawn from a large base survey sample of more than 25,000 per year in Australia.

Data analysis

Results from the consumer survey were analysed using descriptive analysis techniques, and by socioeconomic and demographic factors, to identify any areas with significant patterns or differences. Only results with significant differences are reported in this research.

Desktop research

Research conducted by staff examining publicly available reports, articles and industry journals.

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