

Mobile Content Delivery

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The current position and trends for mobile devices and the impact this has on content delivery.

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1 Introduction

This document examines the current position and trends for mobile devices and the impact this has on content delivery. We will examine the variations between devices and the requirement for content optimisation. Content delivery covers mobile internet, applications, and messaging.

This should give the reader an appreciation of the difference between providing services for mobile devices compared to PC internet and the additional challenges that need to be addressed.

2 The Difference between PC Internet and Mobile Internet

There are a number of key differences between PC internet and mobile internet. These include:

1. Screen size and resolution
2. Data input capability
3. Browser features
4. Mobile use cases
5. Messaging

These are examined in turn below.

2.1 Screen Size and Resolution

The internet experience on a PC is quite different from that on a mobile device. PCs have large screens of 15 inches or more with typical display resolutions of 1280 x 1024 or higher. Mobile display resolutions start at around 128 x 128, barely 1/100th of the available resolution on a PC. Although mobile device display resolutions on smartphones are typically 240 x 320 and can reach 640 x 480 or greater, the physical size of the display is limited by the requirement to have a small pocket-sized device. Increasing the resolution provides more dots-per-inch, but delivers limited benefit on such a small screen.



Figure 1: A range of mobile phones with differing display resolutions.

The available screen estate is a key consideration when designing the content for mobile devices, and simply reformatting existing PC content is not appropriate.

2.2 Data Input Capability

The data input capability on mobile devices is restricted compared to PCs. PCs have large keyboards and a mouse pointer. Most mobile devices have only a numeric keyboard and entering text requires

multi-tap key entry. Entering text is slow even on mobile devices with full hard or touch-screen qwerty keyboards.

The data input constraints should be considered when designing the mobile application, and data entry should be as limited as possible.

2.3 Browsers

Web content for PC internet browsing is defined in HTML. There are a fairly limited number of popular browsers, namely Internet Explorer, Firefox, and Safari (Apple).

Although individual browsers have their own proprietary behaviour, it is possible to create a single “one size fits all” version that will work across all browsers with a small amount of tailoring.

On mobile devices there is a broader range of platforms and browsers. There are a range of platforms including Symbian, Windows Mobile, iPhone, BlackBerry, Android, and Palm OS. Android in particular is now being adopted by a number of manufacturers and is likely to achieve significant growth. Windows Mobile is likely to be the main loser from the increased Android market share.

The commercial requirement for product differentiation ensures variation between manufacturers and the result is that the conformance to markup and messaging standards is elusive. The consequence is a growing diversity of mobile device behaviour.

On each platform there may be a number of browsers. This includes:

Browser	Manufacturer
Android	Google
WebOS	Palm
BlackBerry	RIM
Blazer (Treos, PDAs)	Palm
Firefox for mobile	Mozilla
Internet Explorer Mobile	Microsoft
Myriad Browser (formerly OpenWave Mobile)	Myriad
Nokia Series 40 browser	Nokia
Safari	Apple
Web Browser for Series 60	Nokia

Although PC content can be delivered in HTML format, there are various formats that may be supported by mobile devices. This includes XHTML, XHTML-MP, HTML, cHTML, SMIL and WML.

2.4 Use Case Consideration

As well as the limited screen size and data input capabilities, the use cases for mobile devices should also be considered when designing services and content for mobile. Services which are used on-the-go should be made available on the mobile. Just taking an existing PC website and reformatting it for the mobile phone is rarely the right solution.

For example, flight booking is a pre-planned activity that is more likely to be completed from a PC in the office or at home. Check-in and flight status are however services that are more conveniently used from a mobile device when travelling. The same may not however apply to cinema bookings, as

this is more commonly an impulse purchase for use on the same day, and is therefore suited to a mobile device.



Figure 2: Passengers find it convenient to purchase their flights online using their PC but check-in for their flights on their mobile phone.

Mobile devices are used in public spaces where people may be sensitive to being overlooked by strangers. This can affect the willingness to enter personal data including payment details into a mobile internet site. Note also that many mobile devices do not support secure (https) connections, and so payment forms should not be presented on such devices.

2.5 Messaging

As well as browsing to “pull” content from a website, it is also possible to push content to devices using mobile messaging. Although some devices support email - the PC push delivery format, this is effective only when the mobile device has a full qwerty keyboard. Mobile devices support a range of push messaging formats. These can include SMS, MMS, and WAP push delivery methods. Each method requires particular content formatting and the appropriate messaging protocol must be implemented to deliver this to the mobile network. The message protocols required include SMPP and MM7.

Delivering content to PCs requires no more than an ISP (Internet Service Provider) connection to deliver email. Mobile messaging requires contracts with multiple mobile networks or aggregators in order to achieve comprehensive international delivery capability.

3 The Need for Content Optimisation

Due to the variation in screen resolution and browser markup support, it is necessary to optimise content for the specific type of mobile device. This involves designing the mobile page flow and applying the appropriate content markup tags, such as XHTML, XHTML-MP, HTML, WML, etc. Suitable stylesheets (CSS) also need to be applied depending on the device and CSS support. It is also necessary to resize images based on the device resolution.

Mobile Content Delivery – The Need for Content Optimisation

The consequences of not optimising can be that image quality is poor or the images are not visible. If the incorrect markup is used, then it may not be possible for the browser to render the page, or an error message may be presented to the user.

A properly optimised mobile internet page achieves cosmetically appealing content with error-free delivery. This results in a great consumer experience and satisfaction.



Figure 3: (left) an un-optimised website (right) an optimised website

3.1 Mobile Page Flow

The pages and page flow should be designed for the mobile device. Simply transferring an existing PC website flow to a mobile can create a number of problems:

- The pages are too big.
There is physically too much content for the limited screen space and lots of horizontal and vertical scrolling is required. Due to user input limitations, horizontal scrolling should generally be avoided on mobile internet services. Vertical scrolling is however acceptable.
- Some of the content is not appropriate in a mobile use case.
e.g. Flight booking.
- The font and image sizes aren't appropriate.
The content isn't scaled correctly for the mobile screen.

The solution includes:

- Limit the content to what is appropriate for a mobile use case.

Consider what content is truly useful when on-the-go. Full content can be available when using a PC at a fixed location.

- Keep the pages short.

It's better to have a sequence of short pages than one long page. When creating a mobile version of existing website content, break the content into digestible chunks. This is particularly true of data input forms. Each page should be a single column sized to avoid horizontal scrolling.

- Pop-ups should not be used to avoid confusing the navigation.
- Buttons may need to be disproportionately large on touch-screen devices to aid selection.
- Formatting ("transcoding") the content for the specific mobile device type.

This involves resizing the images and other content based on the screen resolution, and using the correct markup language.

3.2 Automatic Device Identification

In order to optimise the content based on the mobile device type, it is necessary to identify the type of device or browser. This can be done automatically using the mobile browser http headers. Within the http headers there is various information that can be used to identify the device including the User-Agent profile.

When the device is identified, the characteristics of that device required for content optimisation can be retrieved from a database. The necessary information includes screen resolution, markup language(s) supported, CSS capability, etc. An extensive database must be maintained in order to support the many thousands of mobile device types available worldwide. This database must also be updated on a regular basis with new device details.

4 It's not just about Smartphones

There is a perception that to deliver mobile content, it is only necessary to support smartphones, and that other devices are diminishing and can be ignored. Before we can investigate this assertion further, it is necessary to provide a definition of the term *Smartphone*.

Gartner defines smartphone as "a large-screen, voice-centric handheld device designed to offer complete phone functions while simultaneously functioning as a personal digital assistant (PDA)."

The range of devices in circulation varies dramatically by region. For example, there is a much higher penetration of low-end devices in Asia. This is discussed further below.

4.1 Device Statistics

Smartphones will represent at least 16% of the handset market in 2009 and will capture up to 23% by 2013, according to research firm estimates.

Smartphones will represent between 16.6%-17.4% of the total handset market by the end of 2009, iSuppli said, with the smartphone market growing at a CAGR of 21% until 2013.

Juniper Research has separately estimated that smartphones will represent 23% of all handset sales by 2013, with annual sales of around 300 million.

In-Stat has separately predicted that smartphones will double their share of the handset market to about 20% by 2013, with growth driven predominantly by strong sales in the US market.

Perhaps surprisingly given media hype, Nokia is the clear market leader in smartphones and it is not dominated by Apple or RIM. The following statistics from Gartner are for 3Q 2008:

Nokia	42.4%
RIM (BlackBerry)	15.9%
iPhone	12.9%

5 Applications vs Mobile Internet

Mobile Content can be accessed in a number of ways:

- Mobile Internet Browsing
- Downloadable Applications
- Push Messaging

Downloadable applications are great for games and entertainment, particularly when the content can be made available offline. In order to access live content or execute transactions it is necessary to have a data connection for access to a remote server. This data access can happen within the application, but if there is a lot of mobile data access then a mobile internet service may be more appropriate.

The buzz around application download and app stores is likely to subside. In the PC world, it was once necessary to install a client application for almost any purpose. With reliable broadband internet access, installing applications became much rarer, and many more services are available online through the browser. Now that the availability of reliable high-speed mobile data access is much more widespread, this pattern is likely to be repeated on the mobile device.

It is much easier to manage the upgrade of an application when it is provided as a mobile internet service. Alternatively we will see many hybrid applications where the downloaded application is a thin launcher application with menu items that transparently launch the mobile browser provide access to the individual application services. This application may also provide local storage for key downloaded content such as mobile tickets. The ticket may then be recalled without opening a mobile data connection. The download delay can then also be eliminated.



Figure 4: An example application and optimised mobile boarding pass.

We are already seeing resentment from developers and consumers over the controls and restrictions placed by app stores such as iTunes. Mobile internet provides an open environment where providers can make their services directly available to their customers.

Mobile content can be delivered via push messaging in the form of SMS, WAP push, MMS or email. The content can also contain a URL link to initiate a browser session or an application download.

6 Who is the Customer?

When looking at the range of devices that must be supported, it is necessary to consider the type of customer. This varies depending on the target demographic for the content and the type of application. The spectrum of devices also varies widely by region.

6.1 Demographics

The range of devices depends on the consumer demographics. The 16-24 demographic is biased towards entertainment devices. For a service targeted at business users, then there is likely to be a greater predomination of smartphone devices.

6.2 Regional Variation

In North America, the range of devices is weighted towards BlackBerry and iPhone email-centric devices. In Asia however, there is a much higher penetration of lower-end devices. Europe has a broad mix of devices from smartphones down to low-end “candy bar” phones.

6.3 Application Variation

The device usage is also dependent on the type of application. For example, an airline service may predominantly attract business travellers with BlackBerry or other high-end smartphone devices. A cinema application may attract a broader range of devices, particularly lower-end devices.

7 Conclusion

Mobile content and services need to be designed for the mobile device and use cases. The range of services should be appropriate for use on-the-go and not just replicating what is on the PC website.

Don't just target smartphones or the iPhone. Smartphones accounted for around 16% of the market in 2009, and this is forecast to grow to 23% by 2013. Smartphones will be the minority of devices in circulation for many years to come. The iPhone accounts for less than 2% of the market. Only supporting a limited range of high-end devices can severely restrict the market for the service and potentially create customer resentment where their device is not supported.

Although offering applications may be enticing, this can severely limit the availability of services to your customers. Consider whether the customer is best served by a mobile internet site perhaps complemented by applications for particular devices such as iPhone and BlackBerry.

Email can be a useful option for push content delivery in limited circumstances such as in North America where there is high penetration of email-centric devices like BlackBerry. Otherwise limiting content delivery to email can significantly reduce consumer reach.

To achieve a great consumer experience and brand loyalty and to minimise customer service issues it is necessary to optimise the content for the specific type of mobile device.