

Chapter 2

Understanding the wireless world

In this chapter we will look at the different types of companies that make up and profit from the wireless world. We'll then take a look at the different technologies and systems in place in the wireless world, in order to give you the basic understanding to make the most of the rest of this book.

There are several types of companies that operate in the wireless world, and the number is growing as the industry expands. All these companies are important parts of the overall structure, and all of them generate revenue from it; they range from the behemoth network operators down to the ring-tone and content aggregators. As the mobile industry has now turned from a specialized technology market to a mass consumer market, practically any company can enter the wireless world; the question that needs to be asked is, how can a company best profit from the range of services on offer?

The main players in the wireless world

- 1 *Phone users.* These are the end-users who use all the services, whether they are aware of it or not. They are the 'grass roots' of the wireless world.
- 2 *Network operators.* Network operators are the 'overlords' of the wireless world; without network operators there would be no networks. Each country has a number of competing network operators (see Appendix A). The main network operators in the world are Vodafone, Orange, T-Mobile, O2, 3 Hutchison Telecom and NTT DoCoMo. Operators route messages, bill phone users and collect revenue from them. There is some cross-over with fixed landline operators in some countries, but generally they are separate entities.

- 3 *Access providers.* These are gateways for companies and mobile networks. They offer companies a window to the wireless network and let them take advantage of the technologies on offer (GPRS, SMS, WAP, etc). An access provider will manage commercial and technological relationships with network operators and will try to guarantee a quality ('always-on') service.
- 4 *Platform providers.* Platform providers are similar to access providers, except that they go one step further to provide a software-based platform to enable the launch of a mobile-based service. They handle the whole process, from user experience through to network billing and customer support, and because of this they need to work closely with and have an in-depth knowledge of the other service providers in the wireless world.
- 5 *Content and application developers.* With the advent of rich media browsing on mobile phones, content developers became an essential part of the wireless world – and an important extra revenue stream both for themselves and for the rest of the industry. Sprite Interactive is one of the top content providers in the UK, and this company, like a number of other content providers, will produce topical and entertaining content for mobiles, either to specification or as part of their own in-house catalogue. Examples of mobile content include news streams, ring tones, logos, Java games, videos, Java applications and so on.
- 6 *Content aggregators and publishers.* These are the companies that sell the content developed by content and application developers directly to the phone users. There can be some cross-over between content aggregators and content developers, but generally the two areas are separate. Content aggregators generally advertise products in magazines and newspapers, from their own web portal and on the television. Examples of large content aggregators are redsuitcase.com (Figure 2.1) and Mob.tv.
- 7 *Corporate companies.* This group includes all kinds of companies who have an interest in the wireless world as a means of communicating with their customers, employees and suppliers, and generating revenue.
- 8 *Marketing and media agencies.* These agencies are involved in the wireless world on a strictly consultancy level, advising companies on how best to penetrate the wireless world.
- 9 *Mobile consultants.* There is usually some cross-over here with access or platform providers. Mobile consultants advise companies on how best to define and implement their wireless strategy.

As briefly mentioned above, there is a large amount of cross-over in the industry between the different types of players. A number of content developers also run sites to sell their content, so can also be defined as content aggregators, and many of the platform and access providers are also aggregators. Each company needs the others in order to best profit from the wireless world. As well as asking



Figure 2.1 The redsuitcase website, www.redsuitcase.com

how can they profit from the wireless world, companies also need to ask how much revenue they are going to make once the idea has filtered its way down to and then through all the other companies above them. It is also worth noting that below network operator level there is now a large number of companies offering very similar services, so to get the most from access and platform providers it's best to consider a number of different options. Some of the best and most imaginative mobile content is coming out of smaller, independent development houses.

Mobile virtual network operators

A Mobile Virtual Network Operator (MVNO) is a mobile operator that does not own its own spectrum and usually does not have its own network infrastructure. Instead, MVNOs have business arrangements with traditional mobile operators to buy minutes of use (MOU) for sale to their own customers. Many are familiar with resellers of telecom services such as long distance, local exchange and mobile network services. MVNOs are similar, but they will usually add value – such as brand appeal, distribution channels and other benefits – to the resale of mobile services. An example of a UK-based MVNO that has done this is Virgin Mobile, which provides SMS messaging for as little as 3 p per text. Successful MVNOs are those that have positioned their operations so that customers do not distinguish any significant differences in service or network performance, yet offer some special affinity to their customers. Well-diversified independent MVNOs can offer a product mix that traditional mobile operators cannot match – for example, supermarket MVNOs could offer a package of shopping rewards and benefits. MVNOs have full control over the SIM card, branding, marketing, billing and customer care operations.

Business issues

The major benefit to traditional mobile operators cooperating with MVNOs is to broaden the customer base at a zero cost of acquisition. It is likely that traditional operators will continue to embrace MVNOs as a means of deriving revenue to offset the enormous cost of building new networks. As more MVNOs expand in the marketplace, they are likely first to target prepaid customers as a means of low-cost market entry themselves. MVNOs are a means of encouraging competition, which ultimately leads to greater choice and lower prices.

Wireless technologies

Now we have covered in brief the main players in the wireless world, the majority of the rest of this chapter will be spent looking at the main different technologies in the wireless world. The wireless industry is one based on advanced technology, so before embarking on a wireless campaign or strategy you should arm yourself with the necessary knowledge to be able to understand and take advantage of this technology. The areas that will be covered are WAP and the mobile Internet, messaging (SMS/MMS), i-mode, application environments (Java, Flash, Symbian), and 2G and 3G networks. A number of these areas are covered in much more detail later in the book; this chapter aims to give you the basic understanding of them to begin your journey into the wireless world.

WAP and the mobile Internet

WAP stands for Wireless Application Protocol, and it is the standard by which mobiles and some PDAs access the Internet – so, for example, if you are told to access a WAP site from your mobile, you are accessing a mobile Internet site. WAP is used to deliver information to mobiles and as a gateway to download content, so it is a very important part of the wireless world.

The most recent version of WAP is WAP 2.0, which is a step up from the fairly basic WAP 1.0. It allows the user to download rich content and to have content ‘pushed’ through to them, and lets developers create pages that are much closer to standard websites in look and feel.

WAP is covered in much more detail in Chapter 13.

Messaging

Without doubt, one of the main areas of growth in the wireless world over the past four or five years has been in messaging. To give you an idea of the vast numbers of messages sent, on New Year’s Eve 2004 alone in the UK 111 million SMS messages were sent!

There are four main messaging technologies:

- 1 SMS
- 2 Smart messaging (from Nokia)
- 3 EMS (Enhanced Messaging System)
- 4 MMS.

SMS was the first of these technologies to emerge, and it started life as a straightforward person-to-person messaging service which succeeded because it was simple to grasp and support for it was so widespread. SMS lets you send and receive messages made up of text and numbers to and from mobile phones (and specially equipped landlines). Nokia created an extension to SMS, called ‘smart messaging’, that is available on more recent Nokia handsets. This form of messaging can be used for Over The Air (OTA) phone configuration and updates, picture messaging, logos and so on. The value of smart messaging is that messages can be sent over the standard SMS infrastructure and therefore operators do not need to upgrade their infrastructure. EMS emerged between SMS and MMS, and allows the sending of relatively simple media and extended text messages. MMS is a rich version of SMS; it has been accepted as standard by the 3GPP (the mobile standards authority), and it enables the sending of sounds, pictures and video to and between handsets. MMS messages take the form of short presentations,

and the use of MMS as a business tool is wide and varied – for example, in animated business cards, greeting cards, cartoons and maps.

SMS

WHAT IS SMS?

The first SMS message was sent in December 1992 from a PC to a mobile phone on the Vodafone network. SMS is currently one of the most widely used wireless technologies, and its usage amongst phone users remains very high. It accounts for around 60–80 per cent of average revenue per user (ARPU) and, though its percentage of total ARPU is decreasing due to the emergence of other communication technologies, its usage will remain steady. In the top 20 European countries over 200 billion SMS messages are sent each month, but the usage of SMS goes far beyond peer-to-peer communication; it is a great business tool for interacting with end-users, and it provides a convenient and widely accepted way of billing the user.

HOW AN SMS MESSAGE IS SENT

SMS messages are generally no more than 140–160 characters in length, and contain no images or graphics. When a message is sent it is received by a Short Message Service Center (SMSC), which must then get it to the appropriate mobile device. To do this, the SMSC sends an SMS request to the home location register (HLR) to find the roaming customer. Once the HLR receives the request, it will respond to the SMSC with the subscriber's status: (1) inactive or active; and (2) where the subscriber is roaming. If the response is 'inactive', then the SMSC will hold onto the message for a period of time. When the subscriber accesses his or her device, the HLR sends an SMS notification to the SMSC, and the SMSC will attempt delivery. The SMSC transfers the message, in a short message delivery point to point format, to the serving system. The system pages the device and, if it responds, the message gets delivered. The SMSC receives verification that the message has been received by the end-user, then categorizes the message as 'sent' and will not attempt to send it again.

An SMS message is made up of two parts. The first is the header, which is the message protocol information, and includes the sender's address, type of coding and message validity. The second consists of the data – that is, the body of the message with the information to be transmitted. An SMS can be interpreted with three types of encoding: 7-bit, which is the code for the Latin alphabet; 8-bit, which is the code for data; and 16-bit, which is used for Greek and Arabic alphabets (the number of characters for 16-bit is limited to 70).

There are two types of SMS transmissions: Mobile Originated (MO) and Mobile Terminated (MT). MO messages are messages sent from a mobile phone; these can be sent to another mobile, a computer or a landline. MT messages are messages sent by the network to a mobile phone. To enable the identification of corporate servers by the networks specific numbers can be used; these are called shortcodes, and are covered in more depth in Chapter 6.

Benefits of SMS as a marketing tool

What would get your attention – a printed letter telling you when the installer is coming to connect your broadband, or a text message the day before, reminding you not to go out? The business use of SMS is wide and varied, and it provides a unique intimate link with your customer base. Sprite Interactive has implemented and carried out a number of SMS campaigns; for an in-depth look at these applications of SMS technology take a look at the case studies in Chapter 14.

Advantages of text messaging as a communication tool include the following:

- 1 *Texting is reliable.* Text messaging is generally reliable – you're more likely to get a message twice than not receive it at all. Also, as you can tell when a message has been received, you can automatically resend if it hasn't arrived within an acceptable time.
- 2 *Texting is quick and easy.* Text messages are ideal for getting information to employees who are rarely at their desks, or for sending out information to thousands of customers at the press of a button. Texting has become such a part of everyday life that 'txtspeak' dictionaries have emerged, with characters and words developed specifically to speed up the texting and communication process.
- 3 *Texting is cheap.* It is generally cheaper to send out text messages than to communicate by phone or direct mail. The pricing model for SMS as a whole is simple; the end-user will pay a fixed rate for each message, and intense competition in the market has helped keep costs low.
- 4 *Texting is discreet and confidential.* Incoming messages are discreet and will not interrupt the person you are communicating with to the same extent as a phone call. It can be easier to text than to talk, and it does guarantee an extra level of privacy.

MMS

WHAT IS MMS?

The Multimedia Messaging Service (MMS) adds images, text, audio clips and, ultimately, video clips to SMS (Short Message Service/text messaging).

Although SMS and MMS are both messaging technologies there is a dramatic difference between the two of them as far as content goes, with the average size of an MMS message being much larger than that of an SMS message. At the heart of MMS technology is the Synchronizes Multimedia Integration Language (SMIL) application, which allows the creation and transmission of ‘presentations’ over a mobile phone. These presentations take the form of miniature slide shows, much like a scaled-down version of Powerpoint. SMIL lets the user define what each slide contains, the timing for each slide, and the order in which the slides appear. SMIL data is not necessary and is not supported by certain handsets, but without the SMIL code MMS data is displayed as successive content that the user must scroll through.

MMS messages are sent through WAP – unlike SMS messages, which are sent through GSM. The fact that MMS messages are sent through WAP means that additional network infrastructure has had to be developed. The MMS Centre (MMSC) is the key point of an MMS network. When a message is sent, WAP carries the message between the MMSC and the mobile phone. When an MMS message is composed and sent to another phone, it is transmitted from the sender’s handset via WAP to the sender’s operator’s MMSC. This operator then sends it to the MMSC of the operator of the recipient’s handset; the recipient’s operator then sends the recipient notification that there is an MMS, and once the recipient opens the notification the MMS is sent through to his or her handset from recipient’s operator’s MMSC. This works in the same way if a subscriber wants to download an animated logo or wallpaper; once the content provider has received the subscriber’s request, the provider will send an MMS to the subscriber’s operator’s MMSC. This operator then sends the subscriber notification, and he or she can then download the MMS in the same way as before. The beauty of MMS is that it provides a complete development and billing environment. Sprite Interactive has worked extensively with MMS since its launch, developing the MMS composer application for Freeserve (Wanadoo). More of Sprite’s use of MMS as a business tool can be seen in Chapter 14.

Figure 2.2 shows the Freeserve MMS composer.

MMS is significant because:

- 1 It is a natural evolution from text messaging, which already has a large user base – especially in Europe and Asia
- 2 It has support from key operators and industry players
- 3 MMS messages can be sent to and from e-mail
- 4 Richer applications can be developed using MMS than with SMS.

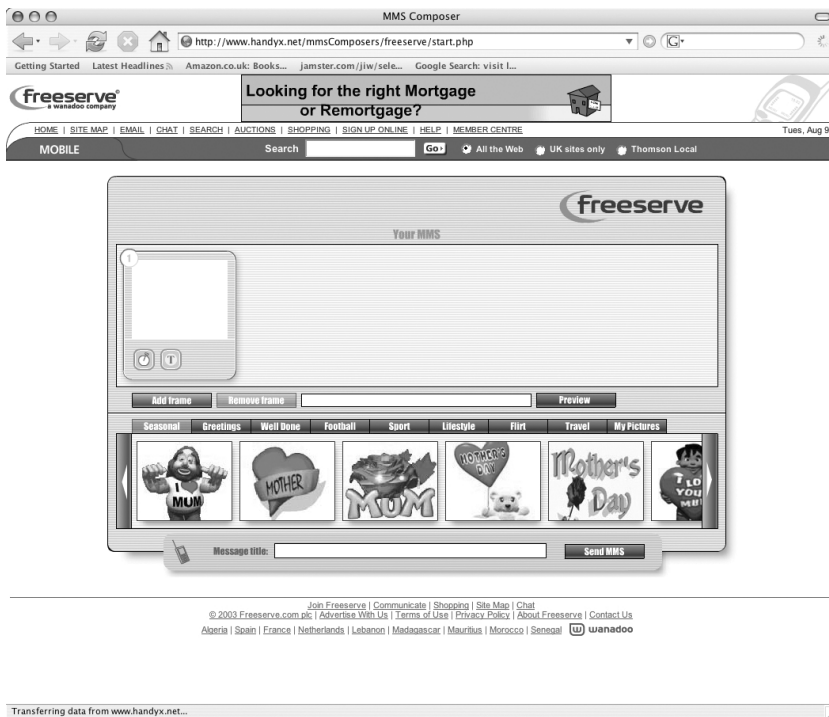


Figure 2.2 *The Freeserve MMS composer*

Unlike SMS communication, MMS communication is not necessarily discreet – i.e. rich media lends itself to being ‘flaunted’ rather than being discreetly in the background. This trend is already noticeable with richer media such as ring tones. A popular example of MMS in action is photo messaging (using an inbuilt camera to take a photograph and then sending that photograph as a message or an e-mail); other examples of where the technology has been used include:

- weather reports with images
- stock quotations with diagrams
- slideshows of football goals
- animated business cards or maps
- video messages with the use of 3G networks.

MMS has not proved to be as successful as many people in the industry predicted when it was launched, and its use today is mainly for photo messaging. There are several reasons for this. First, there is an education and ease-of-use issue. MMS is not as simple to use as SMS and, as a communications tool, is more on a par with e-mail; it is simply easier to send an e-mail than it is to send an MMS, and it is

easier to send an SMS to communicate with someone than it is to send an MMS. With SMS a user can be sent an address to download images or videos onto their mobile; it is easier to follow this kind of message than to receive the same content by MMS, which may also have size restrictions. Moreover, many phones do not come set up for MMS, and phone users may need to call their operator to find out settings, and then have to enter these into their phone manually. This may deter many phone users who do not want to change settings on their phone. Finally, and probably most importantly, is the issue of price. MMS messages are at least twice as expensive as SMS messages, and sometimes more; this is clearly off-putting to phone users.

i-mode

i-mode is NTT DoCoMo's mobile Internet access system, widely popular in Japan. The 'i' in 'i-mode' stands for information. i-mode is also a whole multibillion-dollar ecosystem, and is part of Japan's social and economic infrastructure. Approximately 30 per cent of Japan's population uses i-mode about ten times or more a day, and the system allows them to send e-mail, to book train tickets and to perform other Internet-style activities. There are over 42 million i-mode subscribers in Japan out of a total mobile market of around 70 million, which is a considerable share. i-mode started in Europe (Netherlands, Germany, Belgium, France, Spain, Greece and Italy) in April 2002, and expanded to Taiwan and Australia during 2004.

What is the difference between i-mode and WAP?

Both i-mode and WAP are complex systems. There are several important differences in the way i-mode and WAP-based services are presently implemented, marketed and priced. i-mode uses cHTML, which is a subset of HTML and is relatively easier to learn for website developers than WAP's mark-up language 'wml', many new handsets use html to render web pages. Another difference is that at present in Japan i-mode is 'always on', while WAP systems in Europe operate on a dial-up basis. Another major difference is that at present an i-mode user is charged for the amount of information downloaded plus various premium service charges, while WAP services are charged by connection time.

The success of i-mode

There is no single reason why i-mode has been so successful; its success is due, to a large extent, to the fact that NTT DoCoMo made it easy for developers to develop i-mode websites. In Japan home PCs are not as widespread as in Europe and the USA, so Japanese people tend to use their i-mode handsets more for Internet access than do Europeans or Americans. A low street price to Japanese

consumers for i-mode-enabled handsets means that there is a low entrance threshold; this, combined with the general love of gadgets by the Japanese population, has caused the market to become flooded with i-mode-enabled handsets. The i-mode system is also relatively inexpensive to use, being 'always on'; moreover, and the billing system that i-mode uses (micro-billing) makes it easy for subscribers to pay for value-added, premium sites, and is attractive for site owners wanting to sell information to users. The i-mode system has been effectively marketed in Japan as a fashionable accessory, which has definitely helped, and the use of cHTML for site development has led to an explosion of content as ordinary consumers have been able to develop content. The presentation of content has also helped i-mode to grow, as it is so easy to get to grips with, and the AOL-type menu list of partner sites gives users access to a list of selected content on partner sites that are included in the micro-billing system and can sell content and services.

Business applications for i-mode

There are many business applications for i-mode. Both content and services can be sold on i-mode – for example, airlines sell airtickets via i-mode, media companies sell cartoon images via i-mode, securities houses sell shares and investments via i-mode, and Japanese government lottery tickets are sold via i-mode. The subscriber can have a virtually private network on i-mode. Many companies use i-mode for customer relationship management (CRM). Since about one-third of Japan's population uses i-mode practically every day, i-mode allows companies to engage into dialogue or other interactions with a large part of Japan's population.

Application environments

There are currently three main application development environments for mobile phones: J2ME, Symbian and Flash Lite. These three environments are covered in much more detail in Chapter 12, so we'll only look at a very brief overview of the environments here.

J2ME is the environment with by far the most widespread handset support. The majority of games and applications on sale today have been developed in J2ME; it is a versatile environment, and as handsets get more powerful so does Java support. Symbian content is restricted to Symbian handsets – for example, high-specification Nokias, Sony Ericssons (p800/900) and so on. Symbian applications tend to be much richer than J2ME, with enhanced features and graphics, but are generally priced higher. Flash Lite is the newest application environment, but could make the biggest impact of the three once handset support is widespread enough. Flash Lite opens up the Flash environment to mobile developers, which will lead to advanced user interface development, widespread sound and graphic

support and universal network connectivity, so developers can create dynamic applications which obtain data from existing web services or download different portions of an application based on what the user is doing on his or her handset.

Mobile generations

What are 1G, 2G, 2.5G, 3G and 4G?

Technically, generations are defined as follows:

- *1G networks* (NMT, C-Nets, AMPS, TACS) are considered to be the first analogue cellular systems, which started in the early 1980s. There were radio telephone systems even before that.
- *2G networks* (GSM, cdmaOne, DAMPS) are the first digital cellular systems, which were launched in the early 1990s.
- *2.5G networks* (GPRS, CDMA2000 1X) are the enhanced versions of 2G networks with data rates of up to about 144 kbps.
- *3G networks* (UMTS FDD and TDD, CDMA2000 1X EVDO, CDMA2000 3X, TD-SCDMA, Arrib WCDMA, EDGE, IMT-2000 DECT) are the latest cellular networks, which that have data rates of 384 kbps and more.
- *4G* is mainly a marketing buzzword at the moment. Some basic 4G research is being done, but no frequencies have been allocated. The Fourth Generation could be ready for implementation around 2012.

What is so important about 3G?

The term '3G' refers to the next generation of wireless communications technology, the 'first generation' having been analogue cellular and the 'second generation' (2G and 2.5G) being today's existing GSM/GPRS networks. Today's 3G networks provide high-speed, high-bandwidth support to bandwidth-hungry applications such as full motion videos, video calling and full Internet access. With 3G you can watch music videos, chat with your friends via video calling, send video messages and even watch mobile TV. 3G roll-out has so far been quite slow, but expect to see 3G-enabled applications and content becoming widespread across mobile networks and service providers.