4

Chapter 4

The expanding range of smart handheld devices

4 The expanding range of smart handheld devices

The conquest of mobility requires a parallel evolution in wireless technologies and mobile devices. Small, lightweight devices with high processing power are needed in order to enjoy all the advantages offered by wireless technologies. Handsets have become the main differentiating feature for competition in the mature market of developed countries, where growth in subscriptions is slow. In 2007, most operators in the United States and Europe changed their brand strategies and focused on devices and their capabilities rather than on networks. However, not only the operators, but all the players involved in the mobile market, such as service providers, applications providers, portals, manufacturers, etc., are focusing on and investing in mobile devices.

At the same time, they are offering users increasingly sophisticated data services, and in so doing, upping the requirements for mobile devices. These devices allow users to access those services (TV, mobile Internet, etc.), thus making them a strategic item on the value chain. Handsets have evolved very rapidly in recent years: they have changed from simple models, which were limited to voice transmission, to small pocket PCs or smartphones.

With regard to mobile devices, operators have so far applied their own walled-garden policies. As a result, they selected the handsets that they wanted to distribute and influenced their sales. However, the situation is changing, and the opening of the mobile market will make it possible for the device manufacturers to establish direct commercial relationships with their customers, and to control aspects that have so far been under the operators' control. In recent months, we have witnessed new iniciatives arising from this opening, such as the iPhone from **Apple**[52], **Nokia**'s Ovi service[53], or the alliance formed by **Google**[54] to a create an open programming platform: Android[55].

Projects like the "Open Mobile Terminal Platform"[56] clearly show the growing interest in opening the market in the mobile-device segment. The OMTP is an organization consisting of more than 31 participants from various businesses related with the sector ranging from software and hardware developers, to device manufacturers such as **Ericsson**[57] and **Nokia**. The objective of the OMTP is to establish a series of unique standards in order to simplify the development of mobile applications and their use by the end customer.

The FTF experts analyzed the mobile devices of the future and 45% felt that the trend is towards **convergence** (see Figure 15).

However, they feel that if a mobile device is to be successful in the market, it does not need to have voice services; if it does, it must be targeted at a customer segment or niche, its sales will be lower and its prices will therefore be higher, as they will not benefit from economies of scale.

As the mobile phone is the device that has experienced the most success and growth among the world's population, the analysis in this chapter will focus on

[52] Apple: http://www.apple.com/es/iphone/.

[53] Ovi: http://www.ovi.com/services/.

[54] Google: http://www.google.es/.

[55] Android: http://www.android.com/.

[56] OMTP: http://www.omtp.org/.

[57] Ericsson: http://www.ericsson.com/.

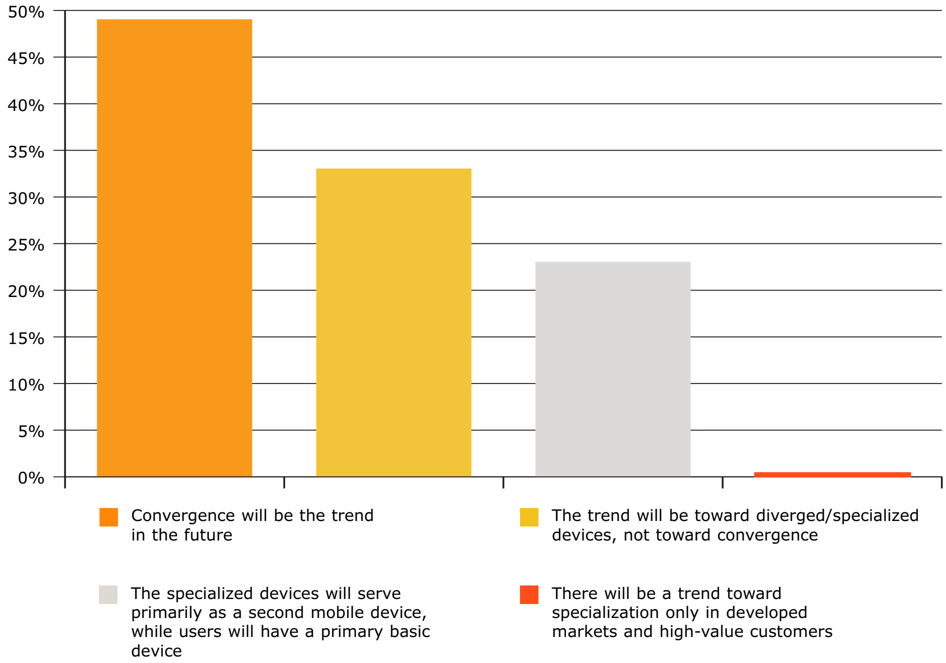


Figure 15. Trend towards convergence of mobile devices.
Source: drawn from the conclusions within the Future Trends Forum.

the devices used mainly for telephone services, without taking laptop computers or other specific mobile devices into account.

4.1. Mobile phones for all tastes

The mobile phone was conceived for making voice calls, and as statistics show, that remains its primary use. However, new models including the latest functions are being released every day, and these go far beyond mere voice services. Phones with limited features (basic or improved) currently coexist in the market with others that have a plethora of advanced functions or smartphones, such as **Apple**'s iPhone or the BlackBerry[58] by **RIM**.

Worldwide sales of these devices were estimated at 991 million units in 2006, according to figures from Gartner[59]. Most are basic and enhanced phones although their relative importance will decrease in the medium term (see Figure 16).

In what regards to devices in Spanish households, 64% have a mobile phone with enhanced functions, compared to the 19.8% that have a basic model (see Figure 17)[60].

[58] BlackBerry: http://www.blackberry.com/.

[59] *Key Issues for Mobile Devices, 2008.* Gartner, April 2008.

[60] *Estudio sobre la situación de seguridad y buenas prácticas en dispositivos móviles y redes inalámbricas.* Information Security Observatory. INTECO. June 2008.

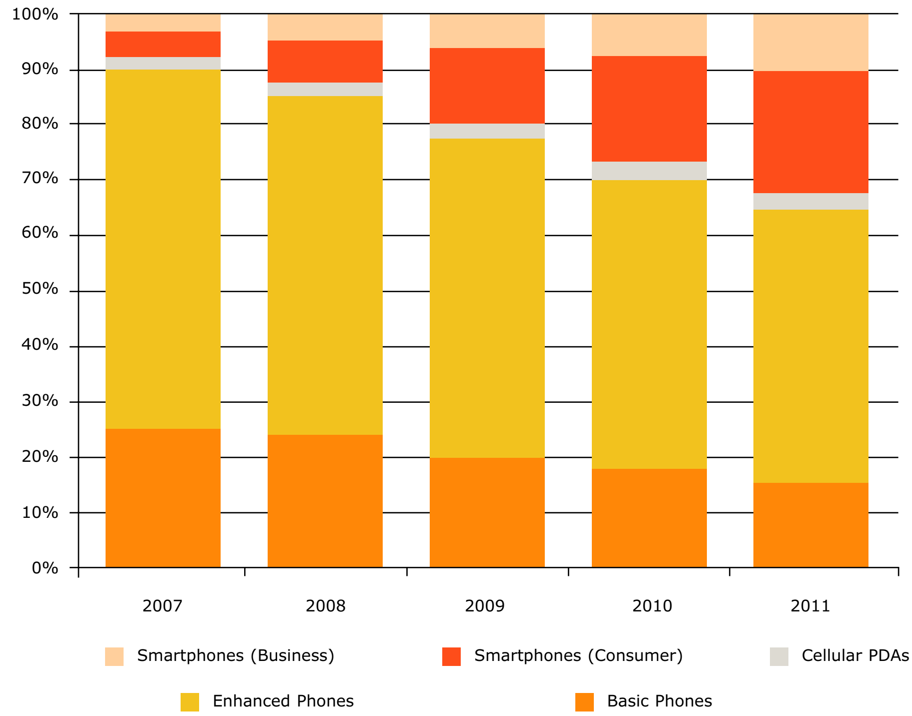


Figure 16. Evolution of handset sales according to features.
Source: Gartner.

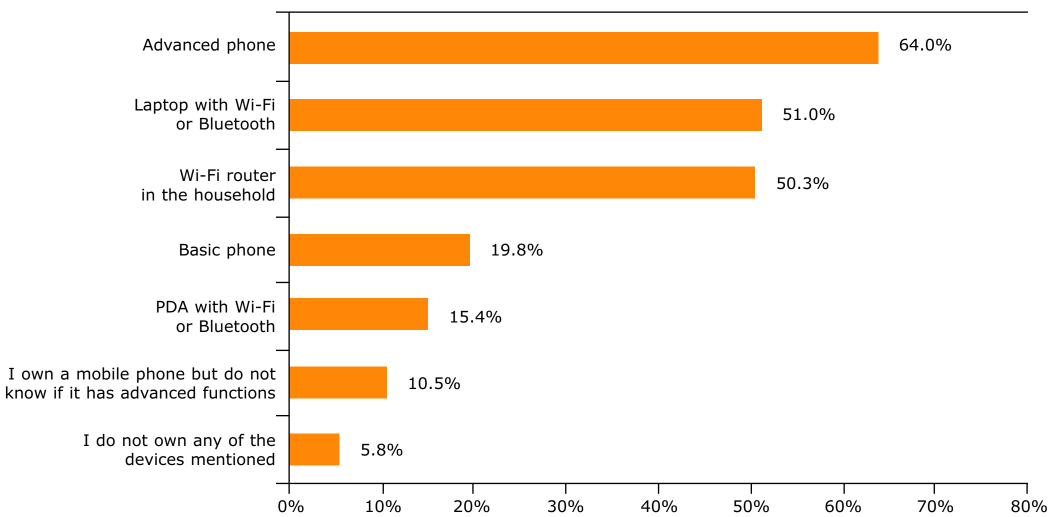


Figure 17. Devices in Spanish households.
Source: INTECO, May 2008.

International sales on smartphones are currently very limited: just 5-10% of users have one. The FTF experts therefore emphasized the need for operators and applications developers **not to limit their innovations to smartphones**, as by doing so they would only reach a limited number of users, which could hinder the opening of the mobile market. This is especially important if the aim is to make developing countries—where most users have basic phones—participants in this opening.

The FTF experts also feel that the price of mobile devices has a direct impact on sales, especially in emerging countries, and affects the opening of the market. In order for their prices to fall, or for them to even be sold, it is necessary to have a significant number of customers. For most people with insufficient income, the price they have to pay to get one of these handsets is more than they can afford. If the aim is to make mobile handsets the main means of access to data and Internet services, then they need to be made affordable. Governments and manufacturers must work towards achieving this.

Furthermore, most consumers in **developing economies** with any purchasing power do not buy a computer as their main electronic device. Instead, they buy a mobile handset, which is less expensive and easier to carry around. This is the approach that has led **Microsoft**'s Chinese division[61] to design Phone Plus, a software application that turns mobile handsets with the Windows Mobile operating system into a small computer that can be wirelessly connected to monitors, keyboards and storage devices, as well as other functions native to PCs.

Most manufacturers are developing basic models to offer them to the next billion subscribers in emerging countries—geographical areas that are making an increasingly large contribution to mobile handset sales figures. In fact, according to figures from Pyramid Research[62], sales in developing countries in 2006 exceeded those in more advanced countries for the first time. As the mobile handset becomes a social status symbol in developing countries, manufacturers are paying more attention to the design of their basic models.

4.1.1. The sale of smartphones

Internet connection from mobile devices is a basic requirement for the opening of the market and will contribute to creating a similar ecosystem of innovation to that of fixed-line Internet. The problem is that only users with a smartphone (i.e. 10%) can access the Internet. The question on everyone's lips is, who will open up the market to the other 90%?

Although these figures are disheartening, consumers in developed countries are driving their expansion as they are the most sought-after mobile device, only surpassed by **memory cards/pen drives**, and are a long way ahead of any other type of mobile device, such as desktop computers, laptop computers, etc. (see Figure 18).

[61] El Argentino: "Microsoft lanza el phone plus", http://argentino.ferengi.com.ar/nota-4090-Microsoft-lanza-el-Phone-Plus.html.

[62] *The Next Billion: How Emerging Markets Are Shaping the Mobile Industry.* Pyramid Research. October 2007.

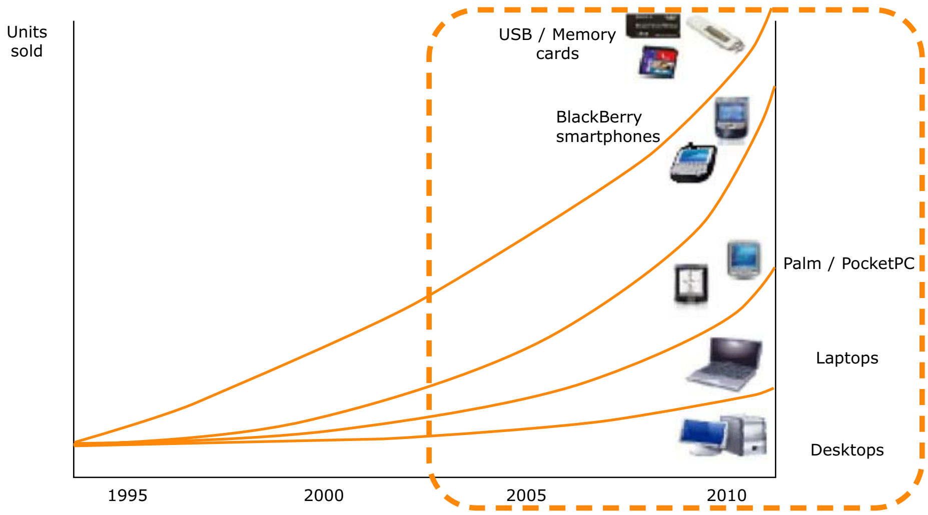


Figure 18. Evolution of units sold by type of device.
Source: *Estudio sobre la situación de seguridad y buenas prácticas en dispositivos móviles y redes inalámbricas.* Information Security Observatory. INTECO. June 2008.

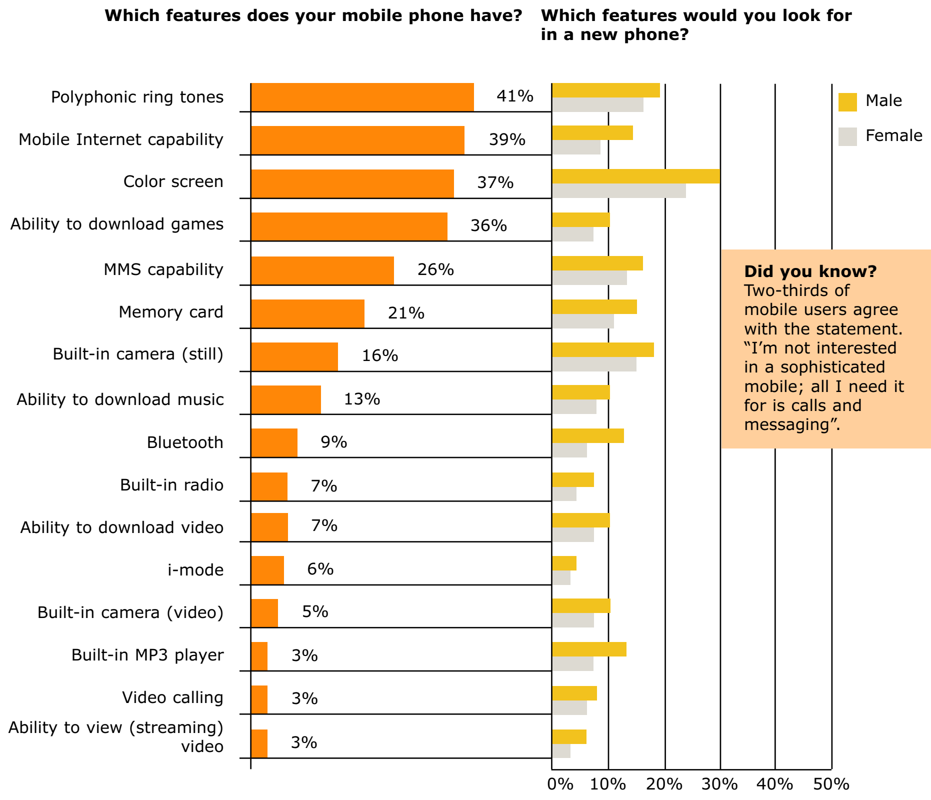
Worldwide sales of smartphones exceeded 32 million units in the second quarter of 2008, which is a 15.7% increase on the same period in the previous year, according to Gartner (see Figure 16). This same analyst[63] anticipates that the sale of smartphones will increase by 42% compared to the figures for 2007 and exceed 1 billion units in 2010.

The rising demand for these handsets, which are equipped with a wide range of functions, is in contrast to the characteristics that consumers say they are looking for when buying a mobile phone. **Two thirds of European mobile phone users say they are not interested in a sophisticated model** but rather a simple handset for making voice calls and sending SMS. At the time of purchase, the most highly valued functionality is a color screen (30% of consumers). The other trendy functions in great demand (downloading games and music, radio, **i-mode**, video, etc.) are valued by few users, and most of them by less than 10% (see Figure 19[64]).

[63] *Key Issues for Mobile Devices, 2008.* Gartner, April 2008.

[64] *Europe's Mobile Consumer.* Christof Herzog, Ph.D. Forrester. June 2005.

Simple mobile features, not advanced ones, appeal to mobile consumers most



Base: European mobile users (multiple responses accepted).

Figure 19. Features sought in handsets.
Source: Forrester.

According to the data, it appears that many consumers have functions on their mobile phones that they are not interested in (for example, polyphonic ring tones: 41% of users say their phone has these functions and only 20% take this into account when buying a mobile handset). Under these circumstances, companies in the sector are faced with the challenge of boosting usage of data services. Companies like **Apple** are taking giant steps in order to achieve this with the introduction of the iPhone into the market.

4.2. What's so good about the iPhone?

The iPhone is a clear case of successful cooperation between various agents in the mobile market and is therefore evidence that the opening of the market benefits everyone. Many people already believe that the new telephone from **Apple** is going to transform the mobile market in record time. This device has highlighted the important role that operators can play in the sale of a handset. In fact, **Apple** has reached very lucrative agreements with the main operators on three continents. What is new about these agreements is that they have given Apple greater control over the design, sale and medium, as well as a share in profits.

The iPhone is the dream of any mobile handset manufacturer or operator. In February 2008, its launch in Spain was announced for June/July of that year, which was enough for **Telefónica**[65] to receive more than 300,000 orders in advance for a 3G iPhone in the United Kingdom and Spain. On the day it hit the market, hundreds of people lined up at the points of sale[66].

Apple has undoubtedly developed the product that many people were waiting for. The iPhone has shown how a handset can change users' consumer habits by becoming a medium for many of their daily activities, such as checking email, surfing the Internet, watching television, etc. It is increasing usage of data services, which is what everyone in the telecommunications market was waiting for. According to a study conducted by iSuppli[67], iPhone users spend proportionally less time on making calls[68]. However, they use it more for other functions such as reading email, connecting to the Internet, looking at videos, photos, etc. (see Figure 20).

65 Telefónica: www.telefonica.es.

66 Mundo Mac. 25/06/2008. Article: "300.000 pre-registros en Telefónica para el iPhone 3G".

67 International Business Times. 3/04/2008. Article: "Apple iPhone Users Do All But Talk". http://www.ibtimes.com/articles/20080403/apple-iphone-ipod-rimm.htm.

68 They spend 46.5% of their time of use on calls, compared to the 71.7% reported for users of other mobile handsets.

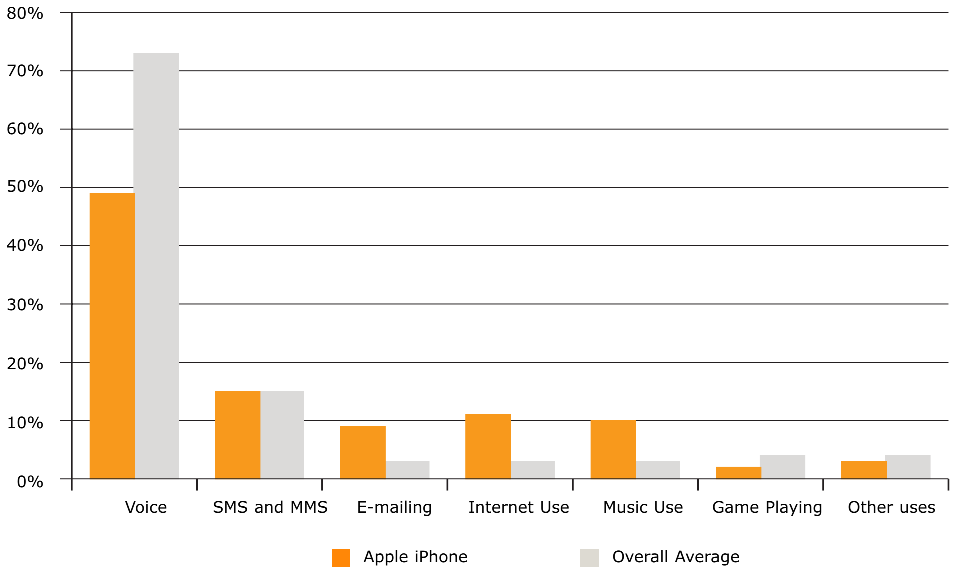


Figure 20. iPhone Time Usage Breakdown for U.S. Consumers.
Source: iSuppli Corporation, April 2008.

A survey conducted by Rubicon Consulting[69] confirms the most optimistic predictions: the iPhone is revolutionizing the use of smartphones and is generating rich profits for mobile operators that have purchased its distribution rights, such as **O2**[70], **T-Mobile**[71], **Orange**[72], **Telefónica**, etc. It will also be an important magnet for attracting users from the competition and for selling other products to consumers.

The iPhone is breathing new life into the market and increasing competition. In this situation, all the operators are preparing strategies to take on this tough competitor and are developing a number of handsets with similar functions and providing cheaper data services (see Figure 21).

Figure 21. In the iPhone's footsteps.
Source: drawn from the conclusions within the Future Trends Forum.

In the medium term, if **Apple** and the operators distributing it want to continue to increase sales beyond early adopters and differentiate their product from the new handsets hitting the market, possibly at a lower price, they will have to invent new ways of offering the added value represented by the iPhone, and educate consumers about the advantages of having unlimited access to data services.

4.3. A new horizon for innovation in mobile applications

The mobile sector has always been an area closed off for users and developers. Handsets have been sold with closed applications and settings that were difficult to change, which forced developers to enter into agreements with operators, manufacturers and other actors in the sector in order to create applications and promote them. This situation was restricting innovation in this area, but the trend is now changing.

[69] *The Apple iPhone: Successes and Challenges for the Mobile Industry.* Rubicon Consulting. March 2008.

[70] O2: http://www.o2.com/.

[71] T-Mobile: http://www.t-mobile.com/.

[72] Orange: http://www.orange-es.com/.

The highlight of 2007 in mobile technology was the appearance of **Apple**'s iPhone and the impetus that gave to the sector after years of voice services being at the core of the industry. The mobile market is increasingly focused on data services as profits from voice services decline. It is anticipated that in 2010, mobile Internet will be used by most wireless users in developed countries. As a result, we are witnessing a battle in which the operators, device makers, Internet providers, technology companies and software developers are fighting for a share of the future mobile Internet access market. The areas in which each key play works are becoming diluted, meaning that they are moving towards direct competition with one another.

4.3.1. May the best mobile operating system win

In this context, as mobile handsets become pocket-sized PCs, the choice of an operating system—the basis for the development of programs and applications—constitutes an unbeatable business opportunity, which no company in the sector is willing to turn down. One need only consider the case of **Microsoft**—which became the world's most successful company in the 1980s thanks to the massive implementation of its Windows operating system—to see that while there are a billion computers in the world, by the end of 2008 there will be over 4 billion mobile phones among the world's population[73].

The most common operating system currently used in mobile handsets is Symbian, with a presence of 60%. It is followed by Windows Mobile (15%), BlackBerry/RIM (10%) and the iPhone/Mac OS X (7%)[74]. This distribution of the market share will soon change. These projects have been joined by other important players, such as **Google**'s Android platform[75].

In response to this threat, **Nokia** wants to relaunch the Symbian operating system, which it recently acquired, as a free and open platform to boost the development of applications. To that end, **Nokia** has created the Symbian Foundation[76], with which it aims to ensure that this system remains the most widespread on the market and even to improve its competitive position against its rivals. The LiMo Foundation[77], which is working on the creation of a Linux operating system for mobile devices, was established with the same goal in mind. Most mobile operators and manufacturers are taking part in these projects, although they expect that the market will have the last word.

The benefits are obvious, as an open and free software platform means everyone in the sector is a winner:

- Manufacturers reduce their software costs.
- Developers have an open platform for building their single applications, which will be used on a vast number of handsets and of networks.
- Operators can increase the value of their network. Taking into account the potential of data services for operators, the development of new applications will connect users to the Internet without them realizing it.

[73] Gizmodo. 27/09/2008. Article: "Mobile Phone Subscriptions to Reach 4 billion by Year's End". http://gizmodo.com/5055914/mobile-phone-subscriptions-to-reach-4-billion-by-years-end. IntoMobile. 15/05/2008. Article: "Ericsson chief expects 6.5 bn mobile subscriptions by 2013". http://www.intomobile.com/2008/05/15/ericsson-chief-expects-65-bn-mobile-subscriptions-by-2013.html.

[74] Gartner. 08/09/2008. Article: "Gartner Says Worldwide Smartphone Sales Grew 16 Per Cent in Second Quarter of 2008". http://www.gartner.com/it/page.jsp?id=754112.

[75] Android: http://code.google.com/android/.

[76] Symbian Foundation: http://www.symbianfoundation.org/.

[77] LiMo Foundation: http://www.limofoundation.org/.

4.3.2. Please develop for my handset!

The development and implementation of an open and free operating system will be a breeding ground for applications developers. Today, very few users download specific applications for mobile devices and if they do so, it is from their operator's portal, such as **Vodafone Live!** and **AT&T MediaNet**, or from distributors like **Buongiorno**[78] and **zed**[79].

Although users are starting to download applications very slowly—apart from ring tones and games—very few download from Google Maps, Yahoo! Go, or World-Mate. The mobile content market is evolving very quickly and attention is now being focused on applications that go beyond traditional games (see chapter 5).

As a result, the aim of the brands is for communities of developers to create applications for their operating systems:

- Microsoft wants communities of developers to create applications so that Windows can easily convert them to its mobile version.
- Apple has launched a development program[80] for the iPhone and an online shop[81] so that developers can sell or give away applications for this device.

Apart from these projects, **many of these players also have their own platforms** for developers to create applications on, thus adding value for the end users[82]:

- Movistar[83] has MovilForum[84] and its version for free software Open MovilForum[85].
- Vodafone[86] operates Betavine[87], where it aims to concentrate developers' talent in order to create applications and services that are compatible with the operator's systems.
- Tira wireless[88] recently launched the Tira 'Go Mobile' Community[89], a portal for content developers with information on how to take advantage of the opportunities offered by the mobile market.

Communities like GetJar[90], founded in 2004, contribute to smoothing the path towards the opening of the market. Its business model is based on connecting all the agents participating in it: consumers, developers, advertising companies, content managers in an interactive environment, etc., in order to develop products.

Meanwhile, Plusmo[91] is a free service providing widgets for mobile devices, those being the mini applications that make the user experience more exciting. There are more than 20,000 widgets on Plusmo, most of which were created by users.

The opening of the market to new developments of applications will lead to an increase in consumer services, which in many cases will be integrated in the mobile device as a standard, with no need to download them. Finally, it should kept

[78] Buongiorno: http://www.buongiorno.com/.

[79] Zed: http://www.zed.com.

[80] Apple Development Program: http://developer.apple.com/iphone/program/.

[81] Apple Store: http://www.apple.com/es/iphone/appstore/.

[82] Soitu.es. 3/07/2008. Article: "Por favor, desarrolla mi móvil". http://www.soitu.es/soitu/2008/07/03/vidadigital/1215081442_723422.html.

[83] Movistar: http://www.movistar.es/particulares/index.html.

[84] MovilForum: http://www.movilforum.com/.

[85] Open Movil Forum: http://open.movilforum.com/.

[86] Vodafone: http://www.vodafone.com/hub_page.html.

[87] Betavine: http://www.betavine.net/.

[88] Tira wireless: www.tirawireless.com.

[89] Tira Go Mobile Community: http://gomobile.tirawireless.com/xwiki/bin/view/Main/WebHome.

[90] GetJar: http://www.getjar.com/software/.

[91] Plusmo: http://plusmo.com/.

in mind that consumers do not understand software platforms, and what they are really concerned about is design, usability, efficiency and price. Developers may design the most wonderful applications in the world, but they will not succeed on the market if they are not included in a handset that appeals to consumers. Design and functionality should go hand in hand.

4.4. Competition and trends in the mobile handset market

The mobile handset market is one of the most competitive in the world and is dominated by five major brands: **Nokia**, **Samsung**[92], **Motorola**[93], **Sony**[94]**-Ericsson** and **LG**[95], which **control more than 80% of the market**. Together, they managed to break sales records for mobile handsets in 2007, reaching 1.13 billion units, according to figures from Ovum[96].

Their global profits fell slightly in 2007; however, **Nokia** was the real market winner (see Figure 22).

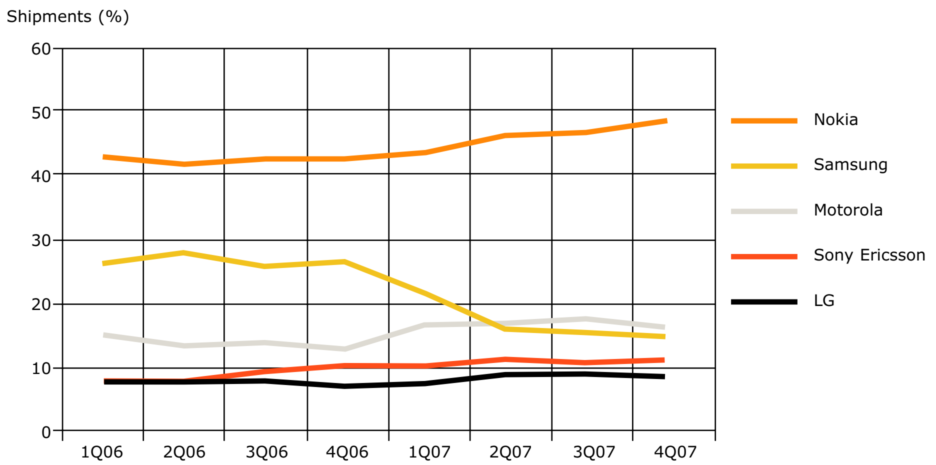


Figure 22. Market share of mobile device manufacturers.
Source: Ovum.

Handset manufacturers have been at the center of some of the paradigms of opening in recent months. As mentioned above, **Apple**, with its iPhone, has succeeded in reducing the operators' control over some points they traditionally controlled.

An example of this loss of control is the emergence of new and alternative means of distribution. Some manufacturers, such as **Nokia**, **Motorola** and **Apple**, have started to sell their devices in their own shops, as well as distributing them through operators.

92 Samsung: http://www.samsung.com/es/.

93 Motorola: http://www.motorola.com/es/.

94 Sony: http://www.sony.es/.

95 LG: http://es.lge.com/index.jhtml.

96 Ovum: *Round-up of the major handset vendors in 2007,* febrero de 2008.

Another change in their business models in recent years is that these handset manufacturers are diversifying their business and becoming service providers. **Nokia** is a clear example of this trend, with Ovi, Maps, Mosh, Medeo, Comes with Music, Internet Radio, Download! **Motorola** has become involved in this change with Screen 3 and SEMC (TrackID, PlayNow).

Another trend is the establishment of agreements with other parties, as occurred with:

- **Sony Ericsson:** Walkman, Cybershot.
- **Nokia:** E-series, N-series, Zac Posen, Versace, Aston Martin, WESC.
- **LG:** Prada, Shine, Chocolate, SC410 sports.
- **Samsung:** Armani, B&O Serene, B&O Serenata, credit-card sized phones.
- **Motorola:** D&G, Pininfarina, Aston Martin, Vivienne Westwood, Red.

As well as this more sophisticated range of products from the manufacturers, the operators are launching new handsets with their own brand onto the market. In fact, Vodafone announced that between 10% and 20% of its range could focus on these products (May 2007).

The FTF experts analyzed what the **trends** in the handheld market will be in the next three years and identified the following as **the main currents**:

- The expansion of a single handset (fixed/mobile). The FTF experts feel that these single handsets will see a greater increase than the mobile handset market. New manufacturers will enter the market and consumers will increase demand (see Figure 15).

- Usability as a distinguishing feature in handsets. 2007 was the year of handsets with large, tactile screens like the iPhone, which clearly demonstrates the importance of usability in satisfying customers and therefore in increasing sales. Consumers are willing to pay more for handsets that are easier to use.

- Special emphasis on older mobile multimedia functions, especially due to the lower cost of storing digital content (music, videos, movies, etc.).

- The introduction of technical improvements to handsets, such as an increase in battery capacity and processing power, with some reaching 32 Gigabytes (GB).

- An increased role for applications with GPS location systems, which open the door to new location-based services. This will boost the rise of handheld devices with this type of service, targeted at specific niches, including those that will not necessarily include voice services.

- The platforms and applications available on the handset, which will be a competitive advantage (operating system, browser, etc.).

- The inclusion of new systems such as accelerometers and movement sensors, which enable movement as part of device handling functionality, along with RFIDs and Wi-Fi in all mobile phones.

- The spread of new applications for medical uses included in handsets. Some of these sensor-supported applications will enable monitoring of health, blood sugar levels, etc.

- Mobile devices able to use M2M (machine-to-machine) services.

- The inclusion of new functions boosting the exchange of information between consumers and the carrying out of various transactions.

- The option of personalizing mobile devices. New manufacturers have emerged in recent months that may change the way mobile handsets are produced if their business models succeed. They give users the opportunity to design their own devices. For example, the company **zzzPhone**[97] lets customers select the colors, features and software.

- The falling prices of handsets.

- An increased concern for security, which will become apparent as usage of data services increases.

- An increased concern for the environment in the use and manufacture of handsets (e.g., green mobile). Of particular note in this area is the increase in the use of nanotechnology and environmentally friendly energy sources. There are also various initiatives for recycling handsets, of which the best alternative seem to be those that increase their useful life. Numerous organizations are following this trend towards recycling handsets:
  - **Greenphone**[98]: This company, a pioneer in recycling mobile phones, is developing innovative new measures for promoting this field, by offering an attractive rewards system. The program mainly targets young people, who are the people who have access to millions of used handsets.
  - **ReCellular**[99], **Collective Good**[100] and **GRC Wireless Recycling**[101], are other organizations working on collecting and reselling recycled handsets.

Other projects are also contributing to the preservation of the environment. For example, the new brand of intelligent universal chargers **iGo**[102], which are compatible with over 9,000 mobile devices and allow users to dispense with the numerous appliances that are currently necessary for charging the batteries on all mobile devices.

4.4.1. Factors influencing the sale of mobile devices

The FTF experts analyzed the characteristics that will determine the success of device sales in the coming years and concluded that the first consideration will

[97] ZzzPhone: http://www.zzzphone.com/.

[98] GreenPhone: www.greenphone.com.

[99] ReCellular: www.recellulartradein.com.

[100] Collective Good: www.collectivegood.com.

[101] GRC Wireless Recycling: www.grcrecycling.com.

[102] IGo: http://corporate.igo.com/iGo_Green/index.htm.

be the usability of the handsets, as shown by **Apple**'s iPhone and the smartphones by **Nokia**, followed by their design (see Figure 23).

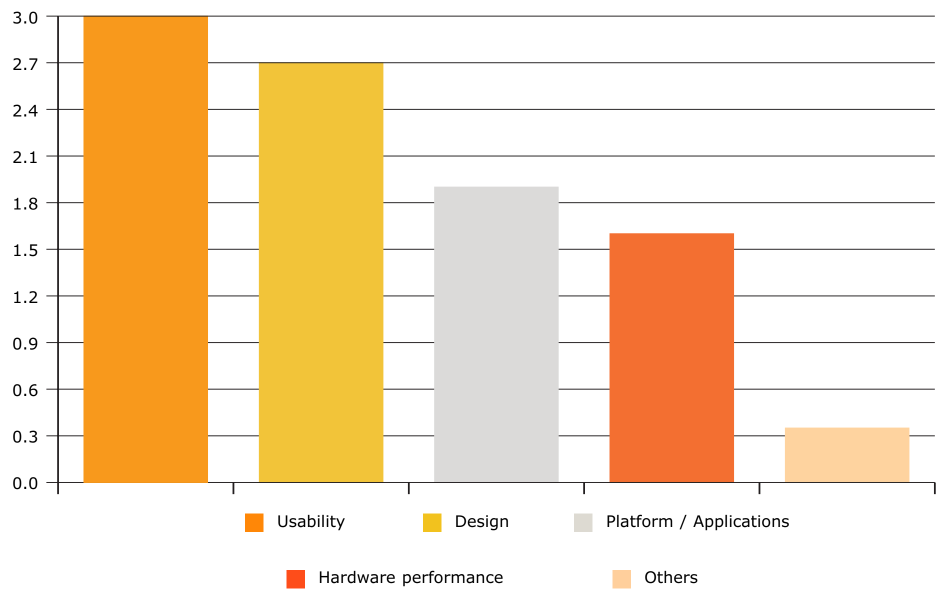


Figure 23. Differentiating features in handset sales in the near future.
Source: drawn from the conclusions within the Future Trends Forum.

For the FTF experts, usability is a key aspect in opening the mobile market up to an increasingly numerous group: older people. The aging of the population is a fact (see the previous **Fundación Bankinter** study "Aging Population and Immigration"[103]) and failing to take these consumers into account would leave a growing number of users outside the market (see Figure 24).

[103] "Publication IX: http://publishing.yudu.com/Freedom/Adizk/09RENuevosConsumidor/resources/index.htm?referrerUrl=.

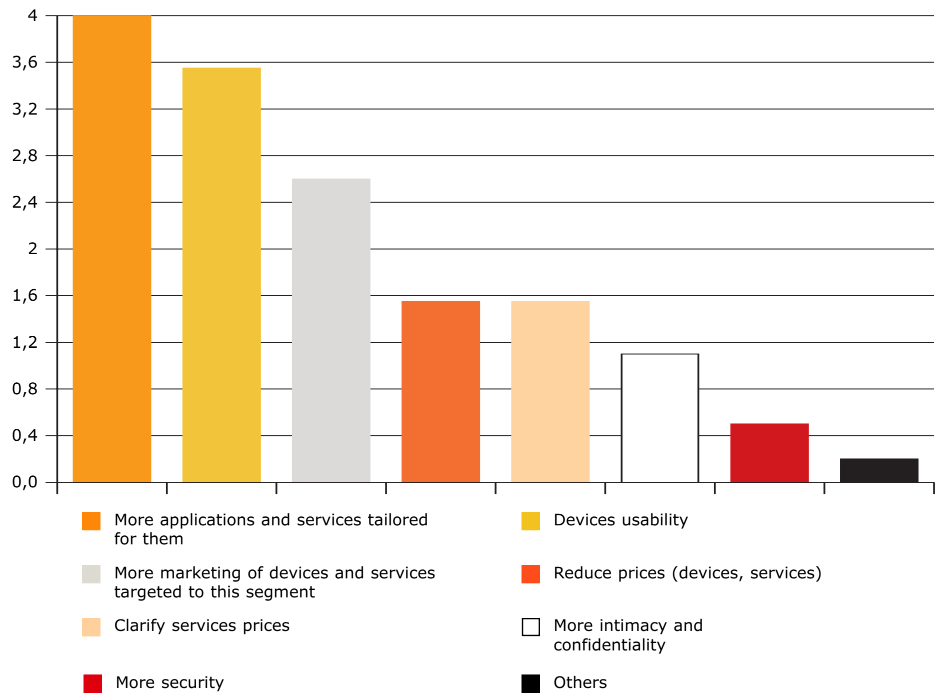


Figure 24. Efforts to increase the sale of handsets and use of data services among older people.
Source: drawn from the conclusions within the Future Trends Forum.

4.5. Case studies of smart handheld devices

A good practice in the personalization of handsets is that of **OpenMoko**[104], which designs handsets with the input of its community of developers. This company has been working on the creation of **a handset based on an open system** for years, with a stated mission of designing the mobile devices of the future. Last year it launched the Neo1973 onto the market, which has a touch-screen, GPS, music and other functions, and sold all the units from its website in three days.

Other companies like the startup **Modu**[105] have also joined the trend that allows mobile devices to be personalized. In particular, Modu has developed its Modu telephone, which is a very basic model with 1 GB of internal memory and an MP3 player, and can only make calls from the address book and send SMS messages. However, the basic functions of this modular mobile can be expanded by slipping it into *accessories such as* jackets or mates.

The success of other companies is based on providing a response to the changes taking place in society, such as the aging of the population. For this reason, several manufacturers are marketing mobile handsets that are simple to use, being

[104] OpenMoko: http://wiki.openmoko.org/wiki/Main_Page.

[105] Modu: http://www.modumobile.com/.

designed specifically for this group. For example, the Austrian company **Emporia Telecom**[106] has designed the emporiaLIFE model in which the screen uses its entire size for letter display, the speaker has a frequency that is low enough not to interfere with hearing aids, and has a simple operating menu. It also includes an emergency key, which automatically makes a call to a preset telephone number when pushed for three seconds.

4.6. Conclusions on the handset market situation

This market is showing a trend towards a greater importance of handsets in the commercial strategies of companies (operators, manufacturers, content suppliers, etc.). The more sophisticated data services demanded by users also increase the requirements made of handsets. However, the main problem lies in the fact that most handsets do not support these services. Only smartphones do so, and only 10% of the population own them. The question, which has already been raised, is who will open up the market to the other 90% of users? Cooperation is essential for breaking down this entry barrier for millions of users, who mostly live in emerging markets.

As for mobile devices, operators are also giving more flexibility to the models they formerly used for selecting the handsets they wanted to distribute. To a certain extent, they have been forced to change this way of doing business due to the ability of new devices like the iPhone to attract customers. There has also been a noticeable change in the business models of the manufacturers, who are shifting towards offering services.

Furthermore, the technological fragmentation of operating systems in handsets is limiting openness and innovation in the area of applications and services. New projects involving multiple industry players are trying to standardize this field in order to promote the development of innovative new services on mobile devices. All the agents in the industry will reap the benefits of this standardization, from mobile operators, who will increase their volume of data services, to device manufacturers and content developers, whose developments will be simplified thanks to standardization.

[106] Emporia Telecom: http://www.emporia.at.