

Report No. 36
Report from the UMTS Forum

Benefits of Mobile Communications
for the Society

June 2004

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0 Executive Summary

This report is produced by the UMTS Forum, an international, cross-sector industry body comprising operators, manufacturers, regulators, application developers, research organisations and IT industry players. The UMTS Forum is promoting a common vision of the development of 3G/UMTS and of its evolution, aiming to ensure its worldwide commercial success. The UMTS Forum has a number of partnerships with international organisations, institutions and other industry bodies (ITU, EC, 3GPP, ETSI, GSMA, 3G Americas, GSA...)

The main activities of the UMTS Forum focus on Spectrum, with studies and contributions on harmonisation of global spectrum for IMT-2000 and its evolution and spectrum arrangements. Other activities covers UMTS Vision, Future Research & Market (Studies into services & applications; market drivers; customer behaviour) but also Regulation (guidance to regulatory authorities and national administrations on licensing and other 3G-related issues), Technical Studies & Implementation (e.g. security, IMS, mTLD, portals, billing & payments and also complementary technologies including WLAN, TDD).

This Report gives the results of the work on Benefits of Mobile communications for the society that has been done within the Operators Group, a sector group of the Forum. This document provides information on the positive impact of the mobile communication industry on national economies and societies.

It is a matter of fact that during the last ten years, mobile communications have been the major contributor to the growth of the telecommunications industry as a whole and one of the most dynamic sectors of the world's economy. End 2001 mobile subscribers outnumbered fixed subscribers in most countries of the world. In many developing countries mobile networks are the ones that provide access to telephony services to the great majority of people.

This Report focus on the impact of Mobile communications :

- on worldwide economic development
- on social links and everyday life

The positive effects on other sectors

Data for years 1999-2002 for 200 of the world's economies, covering 99.98% of the world's population, show spectacular growth of mobiles. End 2002 the number of cellular mobile telephone users exceeded the number of main telephone lines in operation in 125 economies. Among these economies, 40 are high income, 49 middle income and 36 low income economies. At least 69 economies doubled the number of their cellular telephone users and 66 economies added at least 1 million users. China, India, Brazil and the Russian Federation, some of the largest countries in terms of population, added 210 million mobile subscribers. The combined market for mobile services, terminals and infrastructure amounts increased to approximately US\$ billion 600 in 2003, representing about 2% of the 2002 worldwide GDP.

The effects of the information and communications industry as a whole on national economies and economic development are without any doubt. Mobile industry is behind a significant ripple effect on the economy as a whole. The Finnish success is probably the best example of a strong relation between the development of the information society and economic growth. According to the Japanese Ministry of Public Management, Home Affairs,

Posts and Telecommunications the share of communications industry in 2001 in Japan's overall real GDP was 12%. AFOM study (Association of French mobile operators) appraises precisely the impact of mobile communications on a national economy between 1991 and 2002. It appears that the cumulated expenses of the French mobile operators lead to the creation of € 62 billion value added and 205 000 jobs in the French economy.

Job creation

The evolution of the number of employees of mobile sector grew steadily like their investments. For example in Japan in 2001, the information and communication industry, including mobile communications, employed 3.79 M people which represents 7.1% of the country's total working population. In 2000, the overall ICT sector of the five Nordic countries – Denmark, Finland, Iceland, Norway and Sweden – employed 510 000 people (35% - ICT consultancy services, 28% - manufacturing, 20% - wholesale trade and 17% - telecommunications services). In the case of France, in 2002 mobile operators supported nearly 100 000 jobs within the enterprises which are their direct suppliers and more than 84 000 jobs in the rest of the economy. In developing countries - an important number of jobs created in the "official" mobile industry, and the development of informal economy through "Cellular point-phones", "Parallel distribution networks" etc.

Value added creation

The value added created by mobile operators in the entire economy has been widely positive. The following sectors are the main beneficiaries of mobile operators investments, in terms of value added created:

- Consultancy and advertisement
- Retail trade
- Wholesale trade
- Operational services (in particular companies in charge of the deployment and maintenance of base stations)
- Public administrations
- Telecommunication services (fixed operators)
- Electric and electronic equipment (network equipment and handset manufacturers)

In France for example, between 1991 and 2002 the three mobile operators created € 8.3 billion value-added internally and € 54 billion in the rest of the French economy.

Research & development and training

Mobile communications require specific R&D activities and training. Manufacturers producing telecommunication equipment are among the most R&D intensive companies as measured by the proportion of R&D investments of turnover. For example, in 2003, Nokia's R&D spending - 12.8% of its net sales. A considerable increase of professional skills in this sector thanks to training sessions. For example, French mobile operators have dedicated up to 9% of their annual wage bill to training.

Social impact

Concerning the social aspects, this report follows on the previous reports of the UMTS Forum (Report 26 "Social Shaping of UMTS - Preparing the 3G Customer", January 2003 and Report 34 "Informing Suppliers about User Behaviours to better prepare them for their 3G/UMTS Customers", February 2004).

The mobile communications have a significant impact on people's lives, people are intensifying their social relations through their use of mobile phones. It is obvious that mobiles are changing people's behaviours and impact their day-to-day lives. In the professional sphere, the major impact of mobile telephony has been to bring closer the way of working of small and medium enterprises to the one of large enterprises. Mobile are widely contributing to public security, in particular in developing countries where mobile networks often cover areas that are not served by fixed networks.

The organisation of work and productivity

ICT, including mobile telephony, have a two-fold impact on productivity: they improve economies of scale, global factor productivity, "management abilities" and the organisation of production. They increase also labour productivity in certain industries by substituting ICT products (less expensive) to labour. These classical effects are strengthened by the fast diffusion of ICT in all industries and the swift decrease of the price of ICT products. The mobile phone is a particularly suitable tool for managing relocations, increased interactions between partners, suppliers and customers and also an increased control of production etc.

The impact of mobile communications on everyday life

The mobile phone is now the most intimate aspect of a user's personal sphere of objects (e.g. keys, wallet, money, etc.). Given the high penetration rates in all age groups of the population, in a few years the mobile phones should become basic goods.

Security and coverage of uncovered areas

Mobile communications procures the increased feeling of security thanks to the ubiquity, ease of use and provided coverage of most "risky" areas (motorways, ski resorts, coast). In a number of developing countries mobile networks have become a substitute for fixed telecommunications networks. They provide wider coverage and can be relatively easily and quickly deployed. Their management and maintenance is simpler. The pricing schemes applied by mobile operators makes access to telephony services affordable for the urban poor. Mobile operators are making significant contributions to universal service and universal access, both in terms of serving individual users and through mobile payphones.

The strengthening of social links

The recent evolution of lifestyles and family relationships has certainly influenced the usage of mobile phones. A personal communication tool, allowing to reconcile family life and autonomy, contributes to the management of family relationships which have become more complex as a result of the break-up of the traditional family unit. Young people have adopted text messages to express feelings and to mark their adherence to a group. Children prefer to communicate by SMS since they view them as less "authoritarian" than traditional oral communications. This usage is also widely adopted by hearing-impaired people who consider that the SMS brings them closer to hearing persons. Banks use them to strengthen the links with their customers and even some governments are considering possibility of SMS elections ...

1 INTRODUCTION - THE MOBILE COMMUNICATION INDUSTRY WORLD-WIDE DEVELOPMENT

“The year 2002 marked an historic turning point in the history of telephony, for it was the year when mobile subscribers overtook fixed-line subscribers worldwide. The rise of mobile telephony to overtake fixed has brought with it a huge number of implications, but perhaps the most significant impact is on access, both to basic telecommunication services, and to information and communication technologies (ICT), as a tool for economic and social development”¹.

Data for the period 1999-2002 for 200 of the world's economies covering 99.98% of the world's population shows that growth in global ICT diffusion has been spectacular and that “the greatest dynamism was exhibited by the growth cellular mobile subscribers ... Of the 6.2 billion people in the world, 1 in every 5 is a cellular mobile telephone subscriber, up from 1 in every 12 three years ago. In this period, the number of cellular mobile telephone subscribers grew 134 percent, outpacing the 21 percent growth of the number of main telephone lines in operation. Since 1999, there have been 662 million additional cellular mobile telephone subscribers, many more than the 192 million main lines added during the same period”².

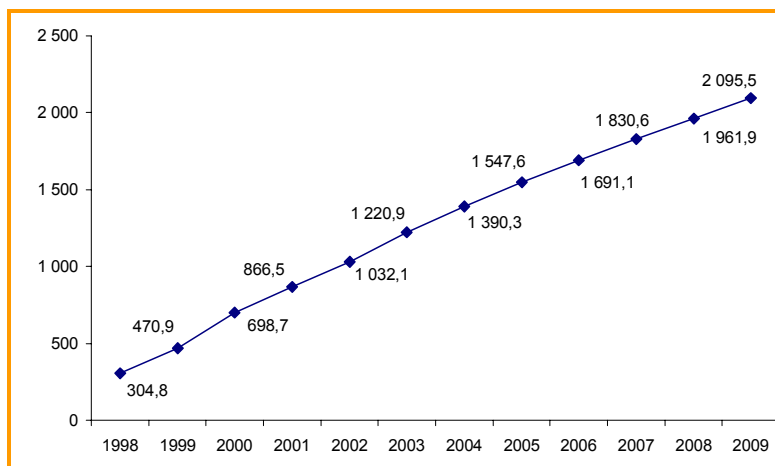
End 2002 the number of cellular mobile telephone subscribers exceeded the number of main telephone lines in operation in 125 economies. Among these economies, 40 are high income, 49 middle income and 36 low income economies. In Italy the difference between the number of mobile subscribers and the number of fixed subscribers is as much as approximately 25 million, in Mexico close to 11 million and in Indonesia nearly 4 million.

Table 1 : Increase in global ICT diffusion at a glance, 1999-2002

	1999 number in M	2002 number in M	1999-2002 increase in M	1999-2002 increase in %	1999 ratio to population	2002 ratio to population	1999 ratio to households	2002 ratio to households
Population	5 962	6 192	229	4				
Households	1 484	1 552	68	5				
Internet users (estimated)	276	605	329	119	1 in 22	1 in 10	1 in 5	1 in 3
Personal computers	394	550	157	40	1 in 15	1 in 11	1 in 4	1 in 3
Main telephone lines in operation	906	4 098	192	21	1 in 7	1 in 6	1 in 2	1 in 1
Cellular mobile telephone subscribers	493	1 155	662	134	1 in 12	1 in 5	1 in 3	1 in 1
Television receivers	1 573	1 775	202	13	1 in 4	1 in 3	1 in 1	1 in 1
Cable television subscribers	288	359	71	25	1 in 21	1 in 17	1 in 5	1 in 4
Home satellite antennas	78	97	19	24	1 in 77	1 in 64	1 in 19	1 in 16

Source : World Economic Forum

Figure 1 : Evolution of the number of cellular subscribers worldwide (M)



Source : Strategy Analytics³

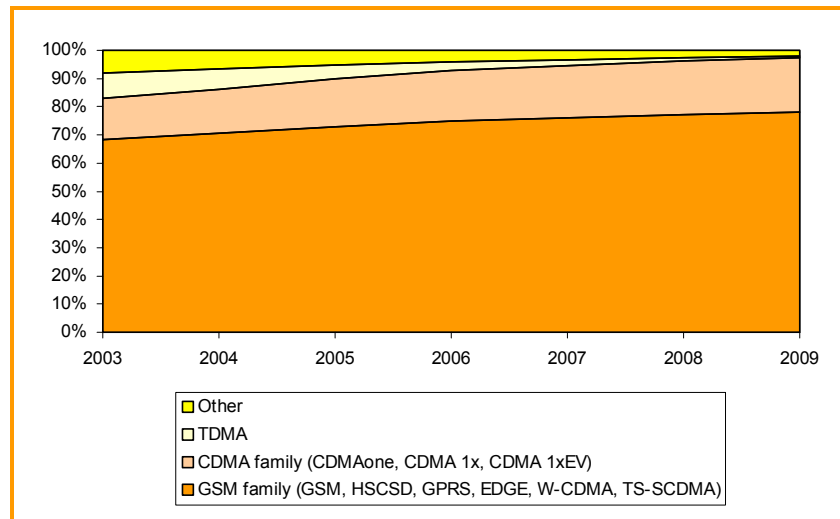
In just three years (1999-2002) at least 69 economies doubled the number of their cellular telephone subscribers and 66 economies added at least 1 million subscribers. China, India, Brazil and the Russian Federation, some of the largest countries in terms of population, added 210 million mobile subscribers. Developing countries, such as Mexico or Morocco for example experienced impressive growth as well.

The number of mobile users will continue grow significantly. It was well over 1 billion end 2002 and should double between 2002 and 2009 to reach approximately 2.1 billion end 2009. The penetration rate, just over 5% end 1998 could exceed 32% in 2009. During the period 1998-2003 the average annual growth rate was nearly 33%, it is expected to be slightly less than 9.5% between 2004 and 2009.

GSM is the dominant technology in 2003.

³ Strategy Analytics "counts and forecasts true cellular users, rather than subscriptions. With account inactivity an issue in most prepaid markets, and the increased use by individuals of more than one SIM card or mobile phone, there is a significant gap between users and subscriptions".

Figure 2 : Worldwide users by technology (M)

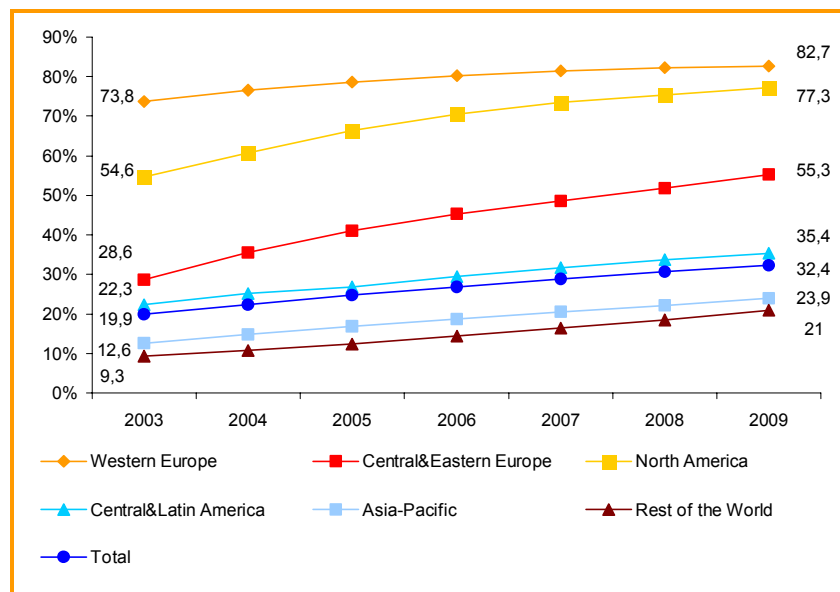


Source : Strategy Analytics

End 2003, Western Europe leads the market in terms of penetration rate and should maintain its leadership in the forthcoming years. In terms of regional distribution of worldwide cellular users, Asia-Pacific is the unquestionable leader end 2003 with 36.3% of the total cellular user base and its share should be over 42% end 2009.

According to Strategy Analytics, worldwide cellular service revenues should raise from US\$ billion 463.1 in 2003 to US\$ billion 758.4 in 2009. Gartner Dataquest estimates that total revenues from mobile terminals stand at US\$ billion 97.3 in 2003 and would be approximately US\$ billion 93.7 in 2007. The total mobile infrastructure market represents US\$ billion 36.9 in 2003 and should reach more than US\$ billion 37 in 2007. Thus the combined market for mobile services, terminals and infrastructure amounts increased to approximately US\$ billion 600 in 2003, representing about 2% of the 2002 worldwide GDP.

Figure 3 : Evolution of penetration rates (in %)



Source : Strategy Analytics

2 MOBILE COMMUNICATIONS : A MAJOR CONTRIBUTOR TO WORLDWIDE ECONOMIC DEVELOPMENT WITH THE POSITIVE EFFECTS ON OTHER SECTORS

During the last decade of the 20th century mobile communications were one of the most dynamic sectors of the global economy and a major contributor to worldwide economic growth. Since the starting up of their activity mobile operators in all countries of the world spent huge amounts of money in order to create and market a new service. Their expenses allowed to create jobs and value added internally, but also in enterprises that were their “direct suppliers”. Even if most of these enterprises existed before the arrival of mobile operators, their expansion during the last decade of the 20th century is widely linked to investments made by mobile operators. Thus today, mobile operators are the “hard core” of a genuine mobile industry grouping together these operators and their first rank suppliers. Through its interaction with the other sectors of the economy, this mobile industry is behind a significant ripple effect on the economy as a whole.

Numerous studies and articles deal with the effects of the information and communications industry as a whole on national economies and economic development.

The Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) for example, publishes each year selected data related to such issues. According to the MPHPT's 2003 report⁴ the market size of the Japanese information and communications industry is expanding steadily since 1995. In 2001 the share of this industry in Japan's overall real GDP was 12%. Furthermore, while from 1995 to 2001 the average annual growth rate of the overall real GDP was 1.2% the one of information and communications industry was 9.3%.

Figure 4 : Ripple effects of IT investments on the Japanese economy, 2001

Type of investment	Investment (US\$, M)		
Software (for computers)	72 057	Value of production induced	375 758 US\$
Computers and auxiliary equipment	96 604	Value of GDP induced	182 687 US\$
Wired telecommunications equipment	16 924	Jobs created	1 594 172
Wireless telecommunications equipment	45 491		
Total	231 076		

Source : MPHPT

The Finnish success, probably the best example of a strong relation between the development of the information society and economic growth, has been widely analysed as well.

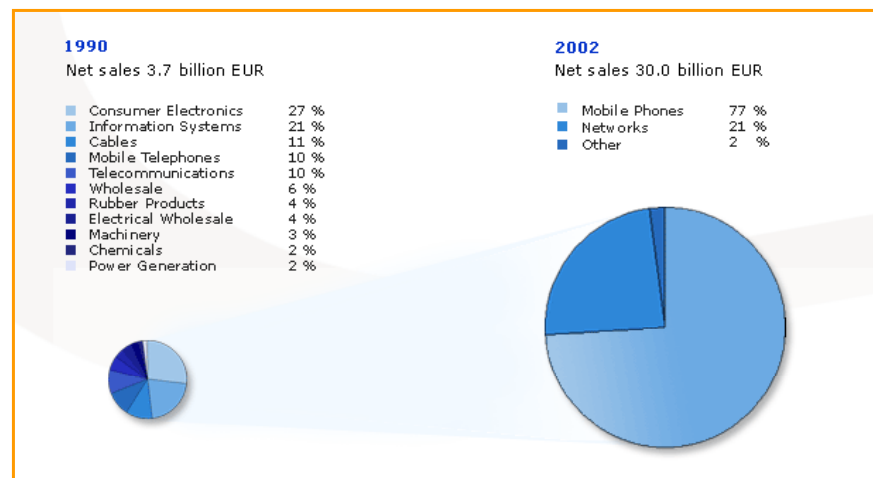
In its 2002-2003 Global Information Technology Report, the World Economic Forum ranks Finland number one⁵ among 82 the countries studied on the grounds that the Finnish public, businesses and administrations have the highest state of readiness for the use and application of ICT. This latter factor is considered to be among the most powerful prerequisites for economic growth. Furthermore, “ICT is today a dominant force in enabling companies to exploit new distribution channels, create new products, and deliver differentiated value-added services to customers. ICT is also an important catalyst for social transformation and national progress”.

⁴ Ministry of Public Management, Home Affairs, Posts and Telecommunications of Japan, Information and communications in Japan 2003 – Building a new Japan-inspired IT society, White paper, 2003

⁵ Brady J, Finland number one in 2003 world IT report, Virtual Finland, 21 February 2003

The World Economic Forum's Global Competitiveness 2003-2004 Report⁶ which surveys 102 countries also ranks Finland number one in terms of growth competitiveness index. This index is a combination of 3 "sub-indexes" : the technology index, the public institutions index and the macroeconomic environment index. As a matter of fact, technology, public institutions and the macroeconomic environment are assumed to be the main determinants of economic growth and development over the medium and long term. Finland is ranked first overall because, unlike most countries, it scored well in all three areas.

Figure 5 : Finland's performance



Source : Nokia

Finland's performance is all the more exceptional since the Finnish economy experienced a deep slump in the early 1990's due in particular to the disintegration of the Soviet Union which caused the collapse of Finnish-Soviet trade. The Finnish growth miracle in the second half of the 1990's has been widely export based and according to calculations the electronics industry built around Nokia, "the world's leading mobile phone manufacturer gave a good six percent additional boost to the Finnish GDP from 1995 to 2000. Thanks to the mobile phone revolution, the share of exports in this country's total output leapt from 20 percent in the early 90's to over 40% today"⁷.

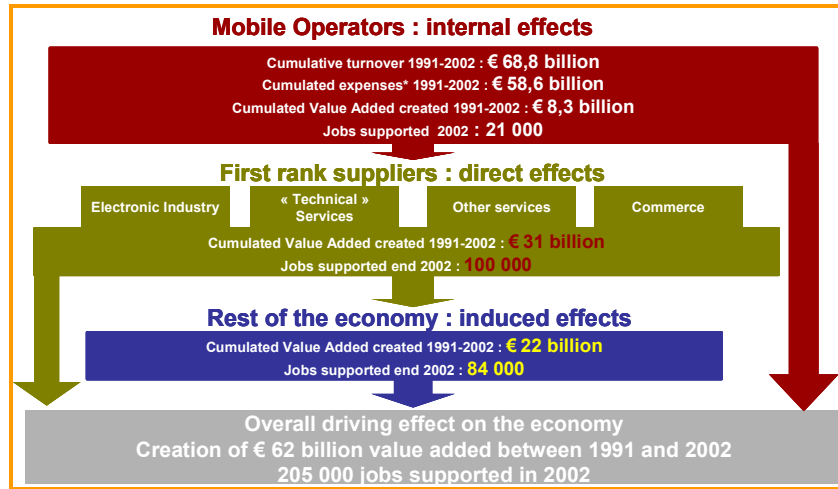
As far as we know, only one study⁸ appraises precisely the impact of mobile communications on a national economy. According to this study, between 1991 and 2002, the cumulated expenses of the French mobile operators lead to the creation of € 62 billion value added and 205 000 jobs in the French economy.

⁶ World Economic Forum, Global competitiveness report 2003-2004, October 2003

⁷ Repo E. and Melender T, Nokia and Finnishness, Behind the News – Economics, 7/10/2003

⁸ TERA Consultants, The mobile industry : study of the impact on the French economy 1991-2002, Study commissioned by AFOM (Association of French mobile operators), June 2003

Figure 6 : The impact of mobile communications on the French economy



Source : TERA Consultants
* : expenses excluding salaries

2.1 Investment

The structure of mobile operators' expenses evolved in the course of time. When mobile licenses were granted the entire activity had to be developed. Even without aiming to develop a mass market from the beginning, mobile operators had to invest rapidly and massively in the deployment of their networks. Afterward, commercial expenses, reflecting and explaining the spectacular growth of the market, are the ones that increased the most quickly. Thus, if at the beginning of the activity the expenses were essentially technical, they became mainly commercial afterward.

Technical expenses can be split up in two main categories : expenses related to networks and expenses related to information systems. Network expenses include mainly the installation of base stations and associated equipment. Commercial expenses include handset subsidies, commissions paid to distributors and advertising campaigns. General expenses include in particular costs associated to the use of external call centres.

A study published by the World Bank⁹ values the world's infrastructure stock in 2000 at about US\$ 15 trillion and mobile infrastructures' share in this total is about 3.3%. This means that the total value of worldwide mobile infrastructures was approximately US\$ 495 billion in year 2000. According to the authors' projections, between 2000 and 2010 "the largest increases in coverage will occur in telecommunications, particularly mobiles phones". The average annual increase of mobile infrastructure stocks should be 40.1% in low income countries, 26.6% in middle income countries and 3% in high income countries.

⁹ Fay M., Yepes T., Investing in infrastructure : what is needed from 2000 to 2010, World Bank Policy Research Working Paper 3102, July 2003

Table 2 : Sectoral allocation of investments, new and total

	Developing countries		World	
	New	Total	New	Total
Electricity generation	32%	30%	30%	30%
Roads	17%	19%	31%	31%
Mobile	32%	27%	23%	20%
Telephone mainlines	13%	14%	11%	11%
Water and sanitation	6%	8%	4%	6%
Rail	1%	2%	0%	2%
Total (%)	100%	100%	100%	100%
Total (US\$ million)	233 139	464 793	369 095	848 719

Source : World Bank

“New investment needs are estimated to be approximately US\$ 370 billion per annum for the period 2005-10, amounting to nearly 1% of worldwide GDP. Another \$ 480 billion (1.2% of global GDP) are needed for maintenance. The total resources needed are therefore approximately 2.1% of GDP, excluding any expenditure on rehabilitation or upgrading. ... In terms of sectoral allocation, three sectors (electricity, mobile phones and roads) will absorb four fifth of developing country and worldwide new investment. Electricity generation is likely to absorb about 30% of new and total investments. ... Mobile is expected to be the next most important expenditure item, absorbing another third of new and total investments in developing countries. This implies developing countries would spend about 0.9% of their GDP in new investments in mobile but up to 1.5% if maintenance is included.”

Table 3 : Expected annual mobile investment needs 2005-2010, \$ millions

	New	Maintenance
East Asia&Pacific	41 155	26 070
South Asia	3 392	1 815
Europe&Central Asia	9 740	7 298
Middle East&North Africa	1 850	1 344
Sub-Saharan Africa	3 275	2 181
Latin America&Caribbean	15 049	10 015
High Income	11 595	34 934
Low Income	6 393	3 730
Middle Income	68 068	44 994
Developing Regions	74 461	48 724
WORLD	86 056	83 658

Source : World Bank

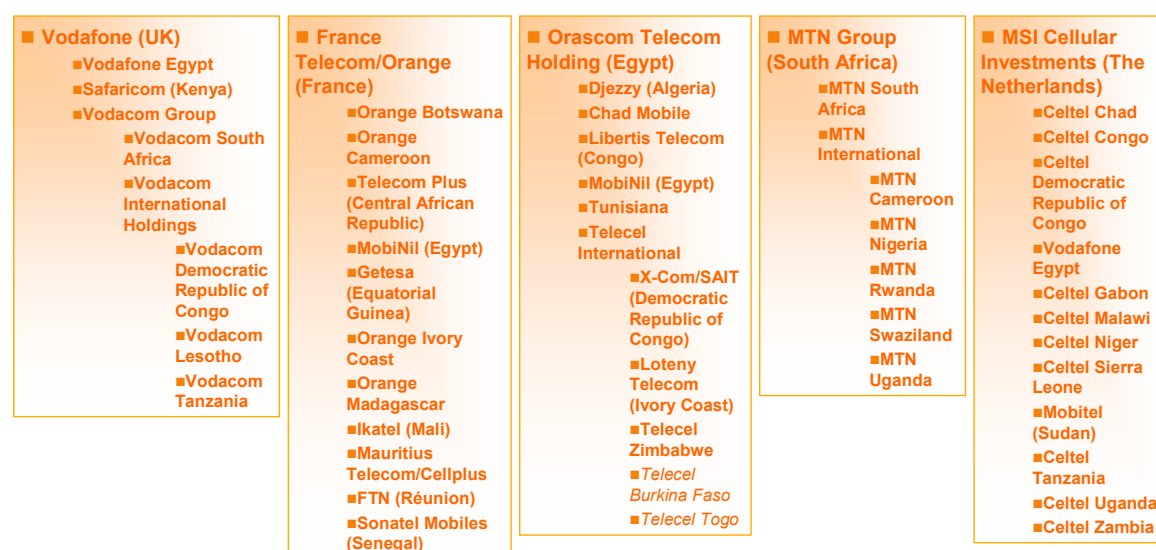
2.2 Foreign investment

During the last decade, telecommunications in general, and mobile communications in particular were one of those industries that attracted the bulk of foreign investments (cross-border mergers and acquisitions, as well as foreign direct investments). This situation can be observed irrespective of regions.

In Morocco for example, “since liberalization in 1997, this sector (telecommunication industry) gathered about 66% of total foreign direct investment in the country, against just 14% by industry and 3% by commerce and real estate¹⁰”.

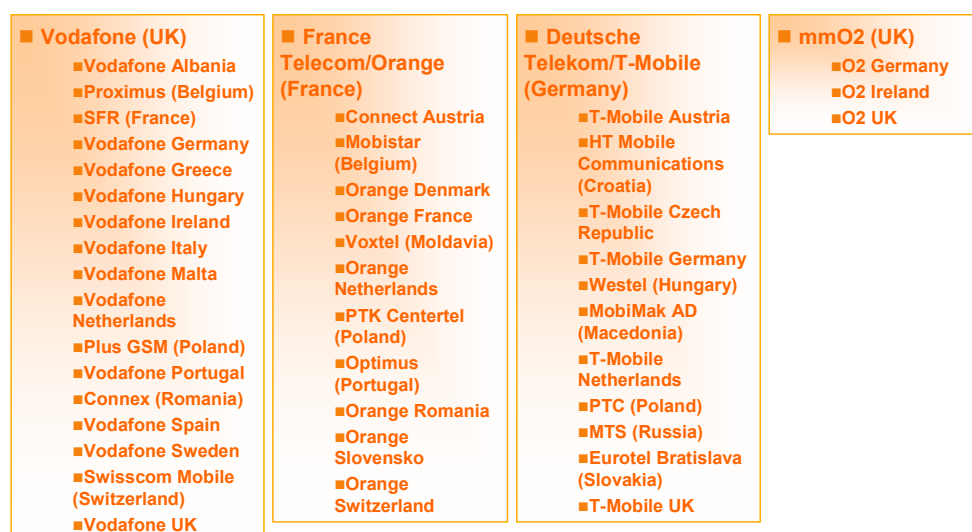
¹⁰ Sarrocco Claudia, Shaping the future mobile information society : the case of Morocco, ITU Document SMIS/08, 25 February 2004

Figure 7: Participations of some international companies in African mobile operators



Source : Operators

Figure 8 : Participations of some international companies in European mobile operators



2.3 Job creation

The number of people employed by mobile operators grew steadily during the 1990's. The evolution of the number of employees of mobile operators followed the same path as the one followed by their investments. The three French mobile operators for example, created more than 20 000 jobs internally during the period 1991-2002.

The evolution of the structure of the wage bill was parallel to the one of the operators' expenses. Thus, the relative share of technical staff decreased progressively, while the one of commercial staff increased.

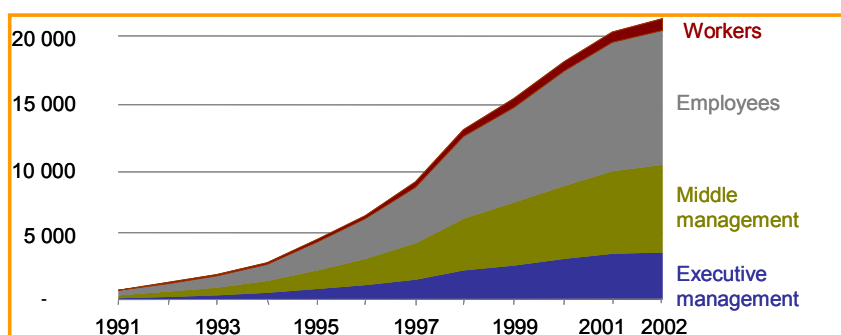
Table 4 : The evolution of the number of employees of selected mobile operators

	1995	1996	1997	1998	1999	2000	2001	2002
AT&T Wireless Services		11 513		12 400	18 260			
Belgacon Mobile (Proximus)	531		1 090	1 320	1 837	2 056	2 333	
Bell Mobility Inc.	2 442	2 681	2 940	3 160				
Bouygues Telecom	549	1 458	2 870	4 232	5 131	6 700	6 562	6 210
E-Plus	2 000	2 300	2 800	3 000	3 400	3 493		
Mobilkom Austria	350	677	1 079	1 460	1 800	2 200	3 251	3 530
Mobistar		292	547	690			1 867	
NetCom GSM AS	291	355	379	465	517	605		734
Nextel				9 700	15 000			
NTT DoCoMo Inc.	6 115	6 323	6 901		13 270	15 100	18 015	19 700
SBC Communications Inc. (Cingular Wireless)	3 659	4 398	5 840	6 851	11 151	13 025		
SFR	1 045	1 700	2 000				6 740	
SK Telecom	4 378	5 456	6 253	5 512	6 692		4 268	4 095
Sonera		826	977	993	1 280	1 626	1 792	
Sonofon	412	771	987	1 153	1 500	1 567	1 778	1 385
Sprint PCS			7 069	9 056	14 951			30 000
T Mobile UK					3 000	5 500		
Telecom Italia Mobile	3 059	5 050	7 104	8 893	9 375			18 702
Telefonica Moviles	1 096	1 831	2 363	2 800	3 372			
Telenor Mobile Communications	658	847	1 331	1 458	1 727	1 777		6 551
TMN	313	376	536	735	940			1 192
T-Mobile Austria (max.mobil)	304	1 000		1 100	1 400	1 900	2 858	
T-Mobile International AG	4 600		5 244			8 534		
Vodafone Libertel		644	843	2 380	2 823	2 870		
Vodafone UK	4 364	4 728	6 051			8 991	10 792	
Vodafone Spain		1 700	2 318	2 968	3 350			

Source : IDATE

Most of the jobs created by mobile operators are stable and skilled. In the case of France for example, executive and middle management accounts for approximately 50% of the total staff of mobile operators.

Figure 9 : The distribution of the total staff of French mobile operators



Source : Tera Consultants

In Japan in 2001, the information and communication industry, including mobile communications, employed 3.79 M people, 7.1% of the country's total working population. This figure places the information and communication industry just behind retail trade and construction, the main "employers" of the Japanese economy.

In a report on Nordic information society¹¹, ICT manufacturing industries are defined as industries "intended to fulfil the function of information processing and communication, including transmission and display, and using electronic processing to detect, measure and/or record physical phenomena or control a physical process". ICT services are "intended to enable the function of information processing and communication by electronic means" and include wholesale trade, telecommunications and consultancy services. In 2000, the overall ICT sector of the five Nordic countries, Denmark, Finland, Iceland, Norway and Sweden, employed 510 000 people or 8.8% of the total work force in the private sector. Of

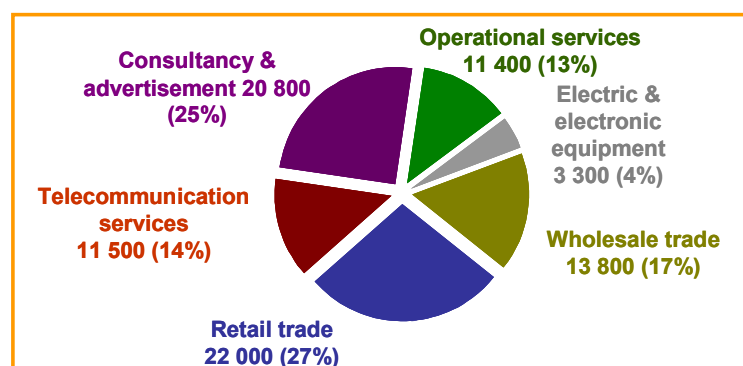
¹¹ Nordic Council of Ministers, Statistics Denmark, Statistics Finland, Statistics Iceland, Statistics Norway, Statistics Sweden, Nordic information society statistics 2002, Helsinki, 2002

this total, 35% were employed within ICT consultancy services, 28% in manufacturing, 20% in wholesale trade and 17% in telecommunications services. In Finland, Nokia's home country, and Sweden, Ericsson's home country, ICT manufacturing accounted for 40% of the overall working population of the ICT sector and for about 10% of the whole manufacturing employment. The share of highly educated employees (with at least a tertiary level education) in the ICT sector is higher than in the private sector as a whole, thus reflecting the knowledge-intensive character of the ICT industry.

In addition to jobs created internally, in a country like Morocco telecommunications services (fixed and mobile) provide employment for approximately 60 000 people¹². Since more than 80% of the total number of subscribers are mobile subscribers a high percentage of these jobs is supported by mobile services. The 2nd GSM operator, Médi Telecom, employs 750 people. The company delegates most of the distribution of its products and services to a few larger wholesalers which manage, directly or indirectly, about 5 000 shops and sales-points. 600 additional shops are directly controlled by Médi Telecom. These related activities provide jobs for 5 000 to 6 000 people.

In the case of France, in 2002 mobile operators supported nearly 100 000 jobs within the enterprises which are their direct suppliers and more than 84 000 jobs in the rest of the economy.

Figure 10 : Sectoral distribution of jobs supported by French mobile operators in the mobile industry (2002, direct suppliers of mobile operators)



Source : TERA Consultants

In numerous developing countries in addition to jobs created in the “official” mobile industry, mobile operators also contributed to the development of informal economy through :

- Cellular point-phones (post-paid mobile phones being operated as a “public payphone by their owner or the members of his family)
- Parallel distribution networks (supplied by the members of the diaspora living in developed countries. The handsets sold by these networks are cheaper, but they provide neither maintenance nor guarantee).

¹² Sarrocco Claudia, Shaping the future mobile information society : the case of Morocco, ITU Document SMIS/08, 25 February 2004

2.4 Value added creation

Given the importance of their investments, the value added¹³ created internally by mobile operators during the first years following their starting up was negative. The duration of the period during which internal value added is negative depends on the scale of the investments made. More the investments are important the longer is this duration.

However, the value added created by mobile operators in the entire economy has been widely positive since the creation of mobile operating companies and until today. In the case of France for example, between 1991 and 2002 the three mobile operators created € 8.3 billion value-added internally and € 54 billion in the rest of the French economy.

The following sectors are the main beneficiaries of mobile operators investments, in terms of value added created :

- Consultancy and advertisement
- Retail trade
- Wholesale trade
- Operational services (in particular companies in charge of the deployment and maintenance of base stations)
- Public administrations
- Telecommunication services (fixed operators)
- Electric and electronic equipment (network equipment and handset manufacturers).

In 2000, the gross value added of the ICT manufacturing industry represented about 22% of the gross value added of the manufacturing industry as a whole in Finland and approximately 8% in Sweden. The gross value added of ICT service activities accounted for about 14% of the gross value added of total service activities in Finland and approximately 17% in Sweden. The total gross value added of the ICT sector in Finland was about € billion 11.2 and more than € billion 15 in Sweden.¹⁴

2.5 Research & development and training

Mobile operators dedicate a significant share of their expenses to R&D activities. As a matter of fact, mobile communications require specific R&D activities since only network related R&D expenses, representing 5 to 10% of total R&D investments, can be shared with other telecommunications activities. In the first phase of their development, mobile operators' R&D expenses were mainly technical and concerned radio propagation and network deployment optimisation. In a second phase R&D expenses became more and more service oriented dealing with service platforms and 3rd generation systems.

An important share of operators R&D budget benefits to their industrial partners allowing them to develop and market new applications contributing to their economic development. Japan is probably the best example of close cooperation between mobile operators and equipment manufacturers. In this country mobile operators are the ones who own the handsets and play the leading role in R&D activities. In 2002, NTT DoCoMo's R&D expenditures were US\$ million 100. The Yokosuka Research Park established by this mobile operator, houses one of the largest 3rd generation mobile R&D centers in the world. "This close relationship between manufacturers and operators in Japan accounts in part for the

¹³ The value added is defined as the difference between turnover and intermediate consumption.

¹⁴ Nordic Council of Ministers, Statistics Denmark, Statistics Finland, Statistics Iceland, Statistics Norway, Statistics Sweden, Nordic information society statistics 2002, Helsinki, 2002

sophistication and availability of handset technology and the take-up of value-added services¹⁵.

Manufacturers producing telecommunication equipment are among the most R&D intensive companies as measured by the proportion of R&D investments of turnover. In 2003, Nokia's R&D spending amounted to € billion 3.760 or 12.8% of its net sales. As of December 31, 2003, the company employed 19,849 people in research and development centers in 11 countries, representing approximately 39% of its total workforce.

Operators are also contributing to the financing of the higher education system. As a result, several countries experienced an increase of the number of their telecommunication and information technology specialists which permitted to attract the R&D laboratories of multinational companies on their territory.

In France for example, mobile operators have the obligation to dedicate 5% of their annual infrastructure investments in R&D and training. In Morocco, 1% of telecommunication operators annual turnover must be spent for R&D and training.

Furthermore, since the specificities of a new activity require specific knowledge and skills, mobile operators have devoted a significant percentage of their wage bill to the training of their employees. French mobile operators have dedicated up to 9% of their annual wage bill to training and continue to devote 5% of the annual wage bill to this purpose even though their legal obligation is 0.9%.

The development of mobile communications not only allowed a significant expansion of employment in the retail trade industry, but also a considerable increase of professional skills in this sector thanks to training sessions provided by mobile operators.

¹⁵ Srivastava L., 3G mobile policy : the case of Japan, Telecommunication Case Study, ITU, 2001

3 The social impact of mobile communications

Since the development of mobile telephony is a quite recent phenomenon it is probably too early to analyse in depth its impact on users' lifestyles. Easy to use and affordable, mobile telephony has been adopted at all levels of society. "Never before has a technical device become such an important aspect of human lives, and a determinant so powerful of individual identity"¹⁶.

Mobile telephony has created its own usages in relation to proximity and security. Mobile phones are mainly used to call the closest relatives and friends. The handset, the mobile operator or the tariff plan are usually chosen according to their advice. The main reason for subscribing to a mobile telephony service is the ability it provides to make calls in case of emergency.

Thus, mobile telephony has widely contributed to public security, in particular in developing countries where mobile networks often cover areas that are not served by fixed networks. As a matter of fact, "in many developing countries mobile technology is a substitute for traditional basic fixed services and extends access to formerly un-served population groups such as the urban poor and rural users"¹⁷. "The combination of competitive forces and unregulated pricing has achieved the surprising result that mobile operators, initially seen as providing premium services, have become over time the "unofficial" providers of universal service and universal access in an increasing number of developing countries as well as in some more developed countries"¹⁸.

In the professional sphere, the major impact of mobile telephony, at least in developed countries, has been to bring closer the way of working of small and medium enterprises to the one of large enterprises. In developing countries mobile telephony has changed in a significant manner the way of working for small and micro-enterprises.

As stated in an ITU report¹⁹ "Companies are re-engineering business processes along the value chain in order to realize efficiency gains through the use of mobile technology, and individuals enjoy ubiquitous always available ICT infrastructure that is gradually transforming public and private life".

The UMTS Forum has also commissioned two reports: the most recent about Informing Suppliers about User Behaviours to better prepare them for their 3G/UMTS Customers and an earlier report on Social Shaping Preparing the 3G customer.

In summary, the key implications of the earlier investigation showed that:

- 1 Mobile devices do not enable more social relations but more intensive relations with already existing social contacts.
- 2 Users have a more emotional relationship with their mobile phone than they do with other forms of computational device.
- 3 The intersection of public by private behaviours enabled by mobile phones will reach a threshold beyond which resistance will start to occur.

¹⁶ Srivastava L., Social and human considerations for a more mobile world, Background paper, ITU, February 2004

¹⁷ Oestmann S., Mobile operators : their contribution to universal service and public access, Intelcon Research & Consultancy Ltd., January 2003

¹⁸ Oestmann S., Mobile operators : their contribution to universal service and public access, Intelcon Research & Consultancy Ltd., January 2003

¹⁹ Feldmann v., Mobile overtakes fixed : implications for policy and regulation, ITU, 2003

The second study showed that people are intensifying their social relations through their use of mobile phones and that mobiles are changing people's behaviours. This results in people becoming dependent on their mobile phones and in particular that it is changing their behaviours and affecting them in their day-to-day lives. Also Behavioural Convergence is occurring and people are mixing and matching multiple ICT in a personal way such that they have converged the use of devices – fixed and mobile – to suit their own unique lifestyle and ways of doing things.

All of this is showing the profound effect the mobile is having on peoples lives.

3.1 The organisation of work and productivity

Very few studies appraise the impact of mobile telephony on the productivity of businesses.

As a matter of fact, mobile telephony is considered as a convenience, in the same way as fixed telephony, gas or electricity. Thus, its consumption is neither monitored nor analysed. This status of convenience is due to the high quality of service which explains that businesses tend to see mobile telephony as a cost item. Conversely, enterprises consider other information technologies such as data networks (intranet), leased lines or VPN as genuine technological breaks with complex stakes and requiring specific skills. Thus, their efficiency and return on investment hold information system managers' and executive managers' attention. Even though studies dealing with the impact of ICT on the productivity of businesses include telecommunications in their scope, they tend to focus on fixed data networks and data processing equipment to the detriment of mobile voice services, considered as a simple extension of traditional fixed telephony.

ICT, including mobile telephony, have a two-fold impact on productivity : on the one hand they improve, in the same way as economies of scale, global factor productivity, as well as "management abilities" and the organisation of production. On the other hand, they increase labour productivity in certain industries by substituting ICT products (less expensive) to labour. These classical effects are strengthened by the fast diffusion of ICT in all industries and the swift decrease of the price of ICT products.

Mobile telephony consumption has increased spectacularly in all businesses independently of their size. End 2003, there were more than 380 million business users representing 31% of the worldwide cellular user base²⁰. The number of business users should raise to almost 540 million by end 2009.

These figures could be under-estimated since numerous professional people and small enterprises do not necessarily subscribe to business tariff plans. According to surveys in various countries the penetration rate of mobile telephony in medium and small size enterprises is higher than in large companies. This situation is probably due to the fact that until the end of the 1990's large companies attributed a mobile phone to specific categories of staff only (commercial, management).

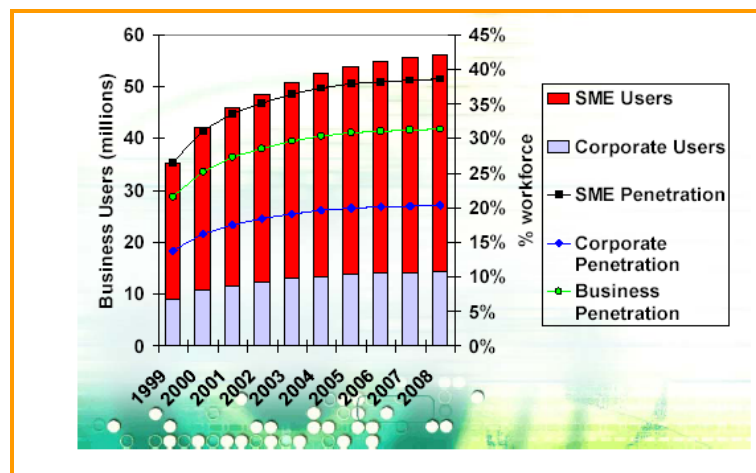
Mobile telephony expenses per employee tend to be higher in large manufacturing companies than in large services companies. As a matter of fact, the share of executive and middle management, "scattered" on various production and exploitation sites, in the total staff of manufacturing enterprises is generally higher than in services enterprises. Furthermore, by the end of the 1990's most large manufacturing companies entered in a phase of global restructuring and rethinking of their working procedures. The latter was mainly focused on

²⁰ Strategy Analytics, Worldwide cellular user forecasts 2004-2009, February 2004. Business users are counted as both those with their cellular service paid for in full by their employer and those with personal phone accounts who expense business use back to their employer.

environmental, quality and security standards, fields where mobile communications are likely to play an important part.

Even though during the last decade of the 20th century mobile communications have not been a determining factor in the strategy or the development of businesses, they have certainly facilitated the sharing and diffusion of information. In manufacturing, as well as services companies, mobile telephony has significantly improved the organisational system and the methods of communication and thus increased competitiveness and customer satisfaction.

Figure 11 : Business market segmentation in Western Europe



Source : Strategy Analytics

In large French companies for example, mobile users make approximately 80 calls per month (with an average duration of 3 minutes), the majority of which is due to the possibility to reach mobile staff. The share of mobile staff accounts for about 30% of the total working population²¹. The major part of productivity gains resulting from mobile communications concentrates on this population who has been hard to reach before the massive adoption of mobile phones.

The industries and categories of staff which are the most concerned by the use of mobile phones and the related organisational changes are listed in Figure 12.

Figure 12 : French industries where mobile communications have had the greatest impact

Services					Manufacturing			Primary sector	
Services to enterprises (consulting, legal, etc.)	Banking, insurance	Wholesale trade	Security Health Home services	Transportation	Building Civil engineering	Chemistry Petroleum products	Utilities (water, gas, electricity, etc.)	Forestry	"Mobile" farmer (shepherds, fishermen)

Source : TERA Consultants

Since the middle of the 1980's, the working methods of large companies tend to be close to those of medium and small enterprises : decisions are more and more decentralised and employees are given more autonomy in order to reduce the duration of processes and of decision making. The aim of this organisational change is to act when needed in the services

²¹ TERA Consultants, The mobile industry : study of the impact on the French economy 1991-2002, Study commissioned by AFOM (Association of French mobile operators), June 2003

industry and to match production to consumer demand in the manufacturing industry. Such increased flexibility has been backed up with more negotiation and interaction and thus more communication with suppliers, as well as customers. Therefore, mobile communications have been a means for facilitating the transformation.

This evolution of working methods has been consolidated at the beginning of the 1990's due to relocations that have occurred in numerous companies the consequence of which is increased from afar inter-action between professionals. Just-in-time methods in the field of trade and manufacturing have also required increased synchronisation of mobile employees, that has been facilitated by the development of mobile communications.

However, mobility has not been the only reason for the adoption of mobile phones by businesses. Researchers have demonstrated that increased interdependence between professionals has been the main reason for the development of business mobile communications. As a matter of fact, such interdependence requires to respond quickly and reactively to requests from an increasing number of partners, colleagues, customers. In such cases, the mobile phone is a tool of rationalisation of work rather than a tool of increased mobility. This is particularly true for executive management and to a lesser extent for middle management. The mobile phone gives executive management the ability to intervene and to travelling employees, middle management and isolated workers the ability, indeed even the obligation, to be reached everywhere at any time.

Thus, the development of mobile telephony has not been caused by individuals' mobility, but the mobile phone is a particularly suitable tool for managing relocations, increased interactions between partners, suppliers and customers and increased control of production, in particular in manufacturing industries.

Mobile phones have also changed the way of working for small and micro-enterprises, in particular in developing countries. Thanks to access to mobile communications, craftsmen, daily workers and farmers have become reachable anywhere and thus able to optimise their schedules and increase their productivity.

Several articles were published on the Grameen Phone Village Pay Phone project in Bangladesh. In the framework of this project mobile phones were leased to low-income women allowing them to provide village payphone services. According to a survey²², approximately 50% of calls made from these payphones concern economic issues such as market prices of commodities, job opportunities, transportations, remittances, and other business items. Access to payphones permitted farmers to make more adequate production decisions and their customers to benefit from a smoother and more reliable supply. It also facilitated job searches and improved rates in foreign-exchange transactions.

Pinoydelikasi in the Philippines started an online store selling delicacies in 1999 and equipped fishermen with subsidised mobile phones in order to expedite order placements. "From an initial capitalization of less than 200 US\$ in 1999, Pinoydelikasi grew to 400 000 US\$ in 3 years, and has provided fishermen on Bantayan Island a regular income that is at least 3 times what they used to earn"²³.

²² Bayes A., von Braun J, Rasheda A., Village pay phones and poverty reduction : insights from a Grameen Bank initiative in Bangladesh, Center for Development Research (ZEF), Universität Bonn, Discussion papers on development policy n° 8, June 1999

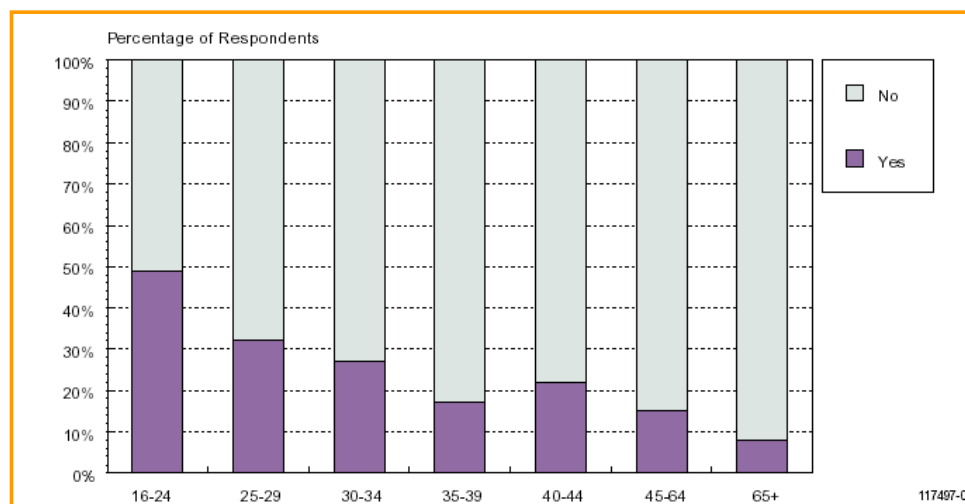
²³ Srivastava L., Social and human considerations for a more mobile world, Background paper, ITU, February 2004

3.2 The impact of mobile communications on everyday life

The “apprenticeship” of mobile telephony by individuals has been a remarkably fast phenomenon of which evidence is given by the exceptional growth of the number of mobile subscribers. In just 10 years, between 1993 and 2002, the number of mobile subscribers has been multiplied by more than 34.

Mobile telephony has created its own usage. Unlike the impact of the development of electronic mail on the amount of “standard” mail for example, fixed by mobile substitution has been only marginal, at least in countries with a high fixed main line penetration.

Figure 13 : The “status” of mobile phones in Western Europe by age group
(Do you use your mobile phone as your main phone?, August 2003)



Source : Gartner Dataquest

Furthermore, even though there is some difference in terms of mobile penetration between age groups, the gap tends to decrease quickly. Differences between age groups are more important in terms of usage of the mobile phone (SMS for example) than in terms of ownership.

Table 5 : Penetration of mobile phones by age

Age	Denmark (2002)	Finland (2002)	Norway (2001)
16-29	89	100	97
30-49	88	98	95
50-59	76	95	93
60-74	58	76	80

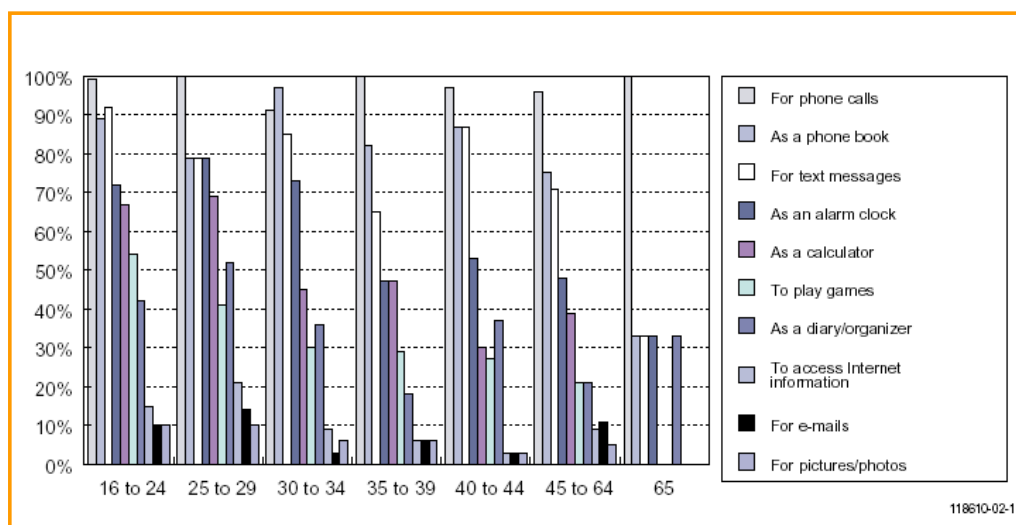
Source : Nordic information society statistics 2002²⁴

A University of Trieste survey of Italian children aged 9 and 10 showed that 56% of them owned a mobile phone. 400 000 British children under the age of 10 had a mobile phone by August 2003 and end 2003 nearly 100% of Japanese girls under the age of 18 owned a mobile phone²⁵.

²⁴ Nordic Council of Ministers, Statistics Denmark, Statistics Finland, Statistics Iceland, Statistics Norway, Statistics Sweden, Nordic information society statistics 2002, Helsinki, 2002

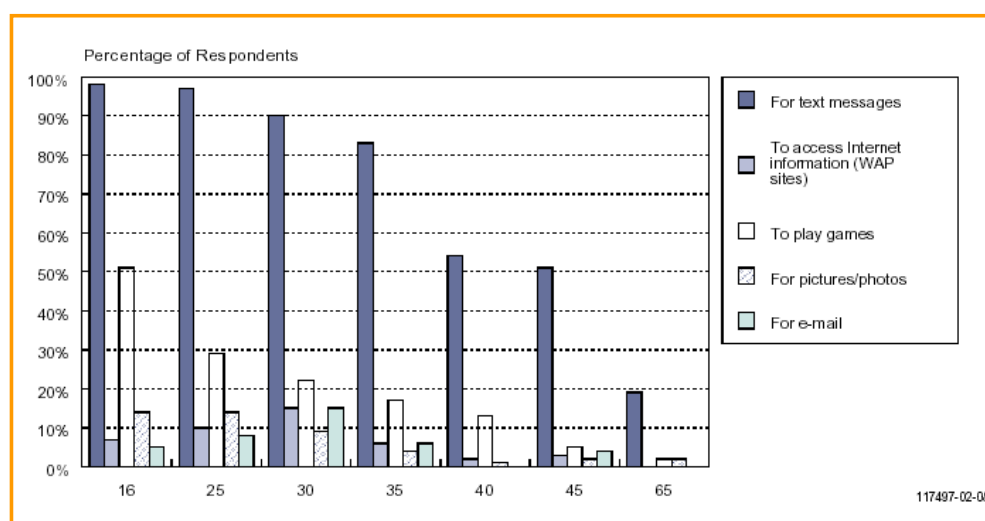
²⁵ Srivastava L., Social and human considerations for a more mobile world, Background paper, ITU, February 2004

Figure 14 : The usage of mobile phones by age groups in Poland and the Russian Federation (August 2003)



Source : Gartner Dataquest

Figure 15 : The non-voice usage of mobile phones by age groups in Western Europe (August 2003)



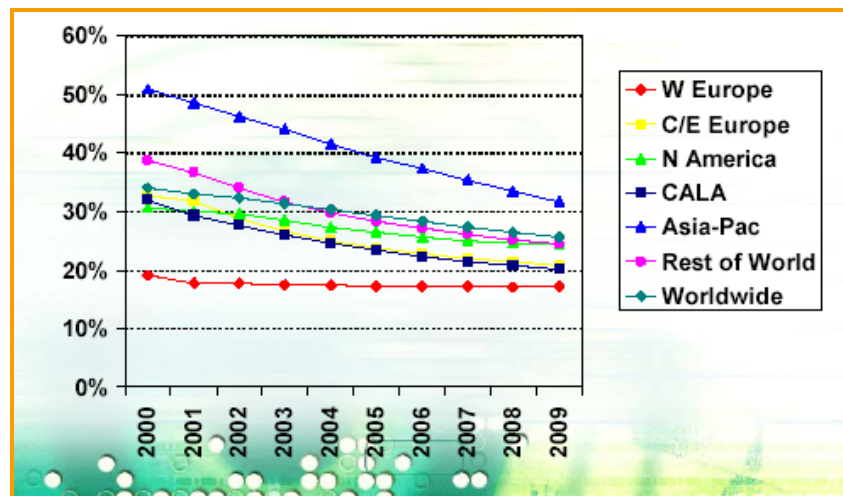
Source : Gartner Dataquest

The intrinsic qualities of the product constitute perhaps the main reason for such a fast diffusion of mobile phones. The GSM standard, developed during the 1980's, led to a genuine technological break in comparison with previous technologies and allowed a phenomenal development of the market.

At the beginning of the 1990's mobile telephony was mainly a "professional" commodity. The relatively low price elasticity of business demand could be explained by the lack of genuine substitutes to mobile phones. During the second part of the 1990's mobile telephony turned

into a consumer good. By the end of the 1990's mobile telephony became one of the major contributors to the growth of household consumption, with a strong impact of price reductions on consumption (positive elasticity).

Figure 16 : The evolution of business users share in the total of mobile telephony users



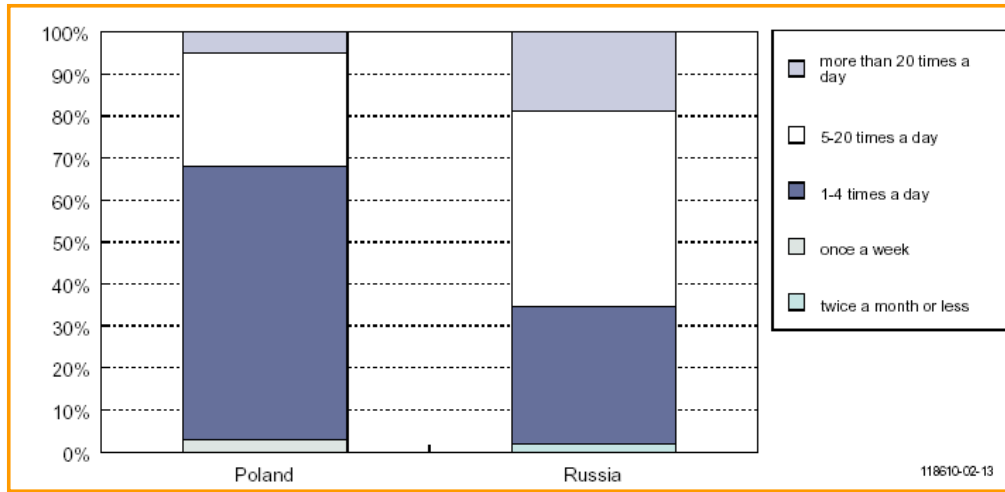
Source : Strategy Analytics

Given the high penetration rates in all age groups of the population, in a few years the penetration of mobile telephony should be similar to the one of television sets and mobile phones should become basic goods; simple to use and for daily use.

In 2003, nearly all Polish and Russian mobile subscribers used their mobile phone at least once a day. In Western Europe, 49% of mobile users make up to 4 calls a day and 31% between 5 and 20 calls. Despite the increase of the share of prepaid subscribers, the percentage of mobile users using their mobile phone less than once a day tends to fall (-3% in Western Europe between 2002 and 2003)²⁶.

²⁶ Gartner Dataquest, Survey of mobile phone users in Western Europe, 2003, User wants and needs, 21 October 2003

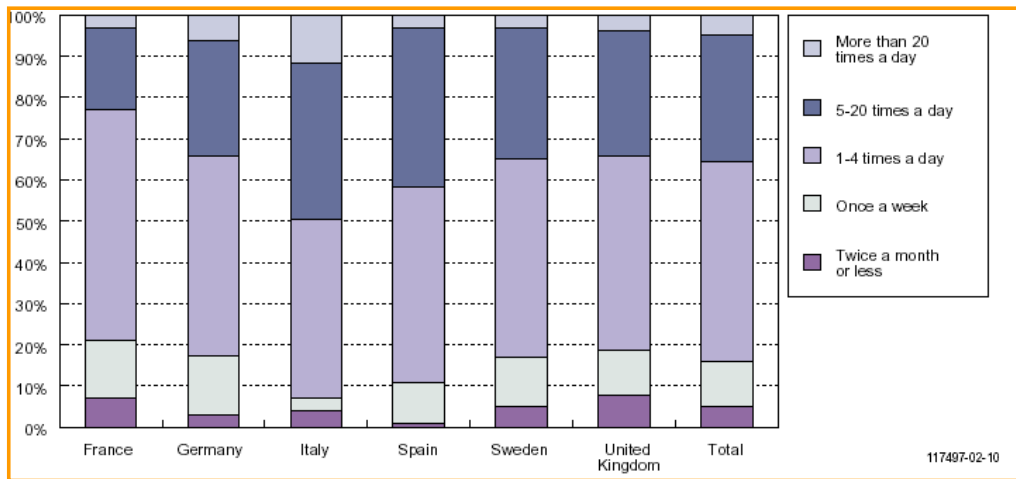
Figure 17 : Frequency of use of the mobile phone in Poland and the Russian Federation (August 2003)



Source : Gartner Dataquest

“The mobile phone has indeed become the most intimate aspect of a user’s personal sphere of objects (e.g. keys, wallet, money, etc.). It gives users the impression that they are constantly connected to the world outside, and therefore less alone. ... Many are afraid to leave home without it ... In a 2003 UK survey, 46% of mobile phone users described the loss of their mobile phone as a form of “bereavement”. For many users, the thought of having their mobile phone privileges revoked can cause indignation and protest”²⁷.

Figure 18 : Frequency of use of the mobile phone in Western Europe (August 2003)



Source : Gartner Dataquest

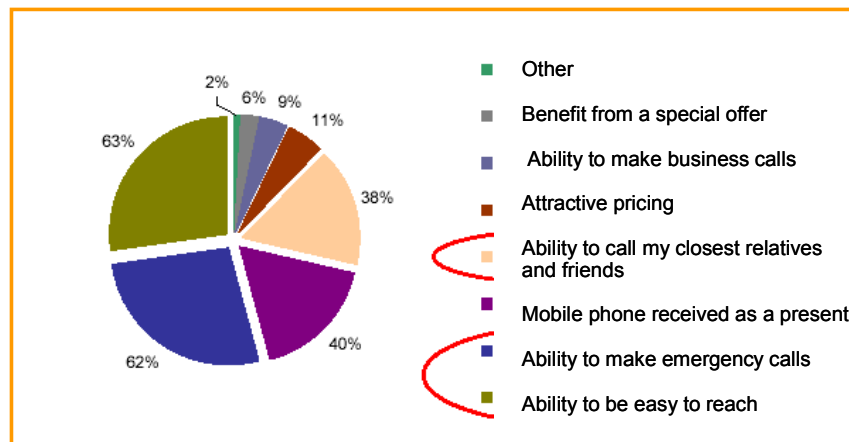
“70% of Japanese mobile users keep their mobile within 1 meter of their body during the day time, and 40% during the night, most likely not far from their pillow. In this respect, the mobile phone has become somewhat an extension of one’s physical self, intrinsically linked to identity and accessibility”²⁸.

²⁷ Srivastava L., Social and human considerations for a more mobile world, Background paper, ITU, February 2004

²⁸ Srivastava L., Shaping the future of mobile information society : the case of Japan, ITU, February 2004

According to surveys conducted in France, the main reason for subscribing to a mobile telephony service is the sense of security it provides to its owner, as well as to the owner's closest relatives. The ability to stay in touch with friends and relatives is also a major grounds for becoming a mobile user.

Figure 19 : Reasons for subscribing to a mobile telephony service in France
(new subscribers, multiple choice questionnaire, 2001)



Source : TERA Consultants

3.3 Security and coverage of uncovered areas

As mentioned above, security is one of the main reasons for using mobile telephony. The sense of security provided by the mobile phone is due to its intrinsic qualities (ubiquity and ease of use), but also to the wide coverage area of mobile networks.

In France for example, mobile operators cover most "risky" areas : 99% of motorways, several hundreds of ski resorts and more than 90% of the coast. On motorways, mobile phones compete with fixed emergency telephones allowing drivers to contact the services of the motorway company in case of emergency. They also compete with public pay phones in urban areas.

The reasons for using public pay phones are : emergency situations, the sporadic need to call somebody, the wish of privacy when making a call or the ability to control the cost of fixed phone calls. Mobile phones perform all these functions, including the control of costs thanks to the SMS and prepaid cards. Thus, pay phones, at least in developed countries, tend to be used by specific population groups only and provide new services such as Internet access.

In the beginning, mobile networks were deployed in high population density areas only but afterward mobile operators started to cover less and less densely populated areas as well. Information related to coverage is published by mobile operators on a regular basis since coverage has been one of the main factors taken into account by individuals when choosing their mobile operator.

In most developed countries more than 98% of the population is covered by mobile networks. Even in a country like Morocco mobile operators covers approximately 97% of the population. However, since mobile coverage is considered as a major asset by the general public, the coverage of rural areas has become an essential political issue in all developed countries.

In numerous developing countries mobile networks have become a substitute for fixed telecommunications networks due to their wider coverage, but also the pricing schemes applied by mobile operators which make access to telephony services affordable for the urban poor. Therefore mobile operators “are making significant contributions to universal service and universal access, both in terms of serving individual users and through mobile payphones”²⁹.

In some developed countries the number of mobile phones is higher than the one of fixed phones because in addition to its fixed line every household owns several mobile phones. In many developing countries first-time users often choose a mobile telephony service as their basic telecommunication service instead of a fixed telephony service.

As mentioned in the introduction, end 2002 the number of cellular mobile telephone subscribers exceeded the number of fixed main telephone lines in operation in 49 middle income economies and 36 low income economies. Mobile operators provide telephony services to customers who have not been served by fixed operators due to the limited coverage of fixed networks, the cost of fixed services or the long waiting lists for fixed telephony services. Thus, “... the greatest impact of mobile communications on access to telecommunication services – in other words, increasing the number of people who are in reach of a telephone connection of any kind – can be seen in developing countries”³⁰.

As a matter of fact, compared to traditional wired solutions, mobile systems are less expensive, in particular beyond 5 km radius from the telephone exchange, they can be relatively easily and quickly deployed, and their management and maintenance is simpler. The “range extension” that can be implemented in GSM networks in rural areas permits to extend the theoretical reach of a GSM 900 MHz base station from 35 to 70, or even 120 km by limiting the geographical spread of the signal in a single direction, as well as the cell sector capacity.

Table 6 : The comparative cost of fixed and prepaid mobile services for a low user

Countries	Start-up costs (US\$)		Monthly costs-calls (US\$)	
	Fixed	Prepaid mobile	Fixed	Prepaid mobile
Argentina	150,00	50,00	13,65	7,95
Brazil	27,00	40,00	7,90	4,50
Chile	43,00	67,10	11,40	8,10
Colombia	168,00	49,25	3,70	4,20
Hungary	71,00	60,00	8,50	7,35
India	18,00	91,85	5,70	6,15
Jordan	141,00	62,40	4,10	2,55
Malaysia	13,00	60,00	5,40	8,80
Mexico	119,00	46,20	16,25	6,90
Morocco	47,00	45,80	6,50	2,10
Peru	131,00	60,40	13,95	4,50
Philippines	12,00	56,30	28,80	5,10
Poland	129,00	53,50	7,40	8,40
South Africa	30,00	51,50	9,45	3,00
Thailand	84,00	89,60	2,85	1,80
Uganda	103,00	121,35	6,80	4,65
Venezuela	103,00	54,00	11,60	6,15
Average	81,65	62,31	9,64	5,42

Source : Oestmann S.

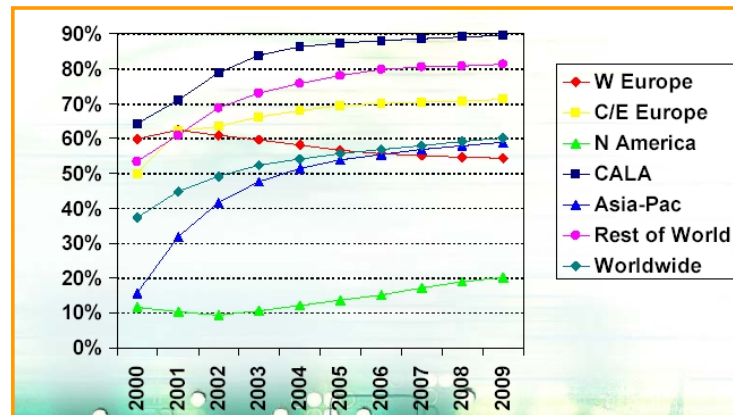
Furthermore, for a customer who needs to make only a few outgoing calls mobile telephony is the most affordable means of access to telecommunications services. On average the

²⁹ Oestmann S., Mobile operators : their contribution to universal service and public access, Intelcon Research & Consultancy Ltd., January 2003

³⁰ Feldmann v., Mobile overtakes fixed : implications for policy and regulation, ITU, 2003

start-up cost of mobile is nearly 25% below the one of fixed. The monthly cost, including a minimum number of calls, of mobile is approximately 40% below the one of fixed³¹.

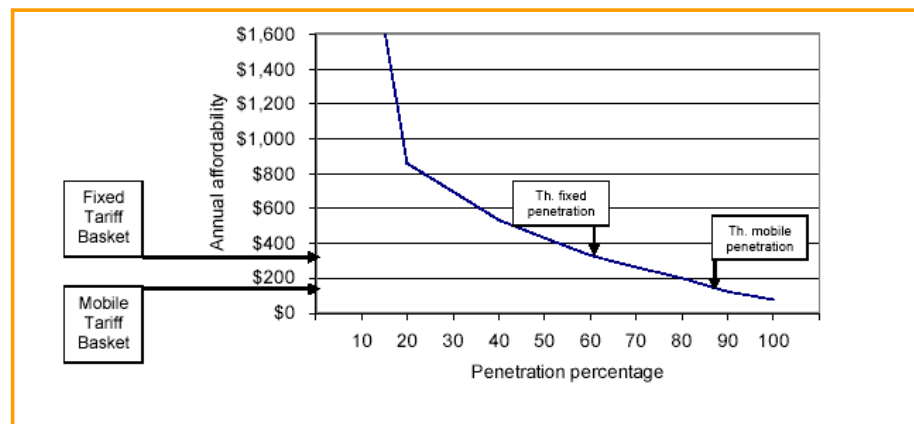
Figure 20 : Prepaid share of total users



Source : Strategy Analytics

In addition to low prices, low-income users need other functionalities such as the ability to control their spending, to just receive calls in times of economic difficulty, hassle-free sign-up, etc. Since prepaid mobile performs all these functionalities, the share of prepaid users in the total of mobile users is high, in particular in developing countries. Thus, “prepaid cellular service reaches, on a commercial basis, many low-income customers who are unwilling to commit to fixed monthly charges, are not creditworthy for normal (post-paid) service, want more control over call spending, or make few calls”³².

Figure 21 : Affordability (theoretical) of telecommunication services in Mexico



Source : Oestmann S.

The case of Mexico, described in an article on the contribution of mobile operators to universal service and access³³, shows that approximately 60% of Mexican households can

³¹ Oestmann S., Mobile operators : their contribution to universal service and public access, Intelcon Research & Consultancy Ltd., January 2003

³² Wellenius B., Extending telecommunications beyond the market, Toward universal service in competitive environments, Public policy for the private sector, Note n° 206, The World Bank Group, March 2000

³³ Oestmann S., Mobile operators : their contribution to universal service and public access, Intelcon Research &

afford fixed services whereas nearly 90% can afford mobile services. The author assumes an average spending on telecommunications by household amounting to 2% of its income. The annual tariff basket for fixed and mobile includes connection or handset, 12 months of monthly rental fee or minimum charges and 180 peak-hour local call minutes. The fixed basket amounts to US\$ 314 and the mobile basket to US\$ 154.

End 2002, the number of mobile subscribers exceeded the number of fixed subscribers by slightly less than 11 million. Baja Celular's (a Mexican mobile operator) subscriber base rose by 180% and its traffic by 80% in just 16 months after the launch of a low-cost prepaid service in 1996³⁴.

The reach of mobile services is all the more important since numerous customers are able to use public mobile pay phones. Mobile public payphones were established in several developing countries by individual entrepreneurs (Bangladesh, Cambodia, India, Nepal, Uganda) or by operators, based on their license obligations (South Africa) or because the mobile technology turned out to be the least-cost solution in rural areas (Chile, Colombia).

The table below gives some examples of mobile public payphones implemented in various countries.

Table 6 : Mobile public payphones in selected countries

Country	Project
Bangladesh,	The rural arm of a GSM operator (Grameen Phone) aims to install at least one fixed cellular phone in 68 000 villages. The company leases handsets to low-income women who sell the service to the rest of the community. The average income per operator has been estimated at US\$ 700/year.
Botswana	Due to their license conditions, mobile operators have to install 500 public phones each in rural areas within 4 years of starting their operations
Chile	The Rural Telecommunication Development Fund subsidises the deployment of public payphones in low-income rural and urban areas. Some of the licensed rural payphone operators decided to install mobile public payphones
Colombia	Mobile technology is implemented in the framework of the Compartel program/Rural telecom fund including payphones
Ecuador	BellSouth implemented several hundreds of mobile payphones and offers also the opportunity to restaurant, shop, gas station and other similar establishments owners to house such payphones
India	Mobile operators are allowed to operate cellular or fixed payphones. Spice Telecom, one of the mobile operators recruits small entrepreneurs to operate mobile payphones
Nigeria	MTN, one of the mobile operators, established the "Ogene community phone project" where women are provided with a GSM handset that should be paid back within a year
South Africa	Cellular operators had to install 29 500 mobile community public telephones in under-served areas. Call prices for these phones are priced at less than half the standard cellular rate
Uganda	MTN's subdivision, MTN Publicom, provides fixed-wireless payphones employing a franchise-type arrangement
Venezuela	Licensing of 3 regional rural operators required to provide public phones, fixed or mobile lines. These 3 operators have formed a nationwide mobile operator

Sources : Oestmann S. and World Bank³⁵

Consultancy Ltd., January 2003

³⁴ Wellenius B., Extending telecommunications beyond the market, Toward universal service in competitive environments, Public policy for the private sector, Note n° 206, The World Bank Group, March 2000

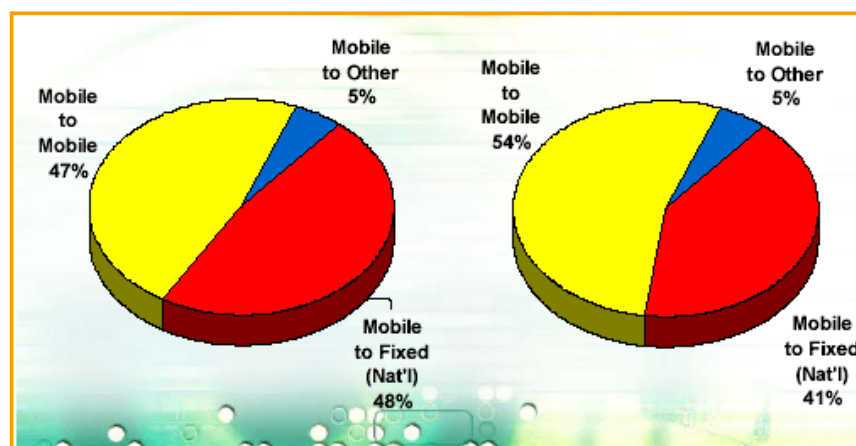
³⁵ Oestmann S., Mobile operators : their contribution to universal service and public access, Intelcon Research & Consultancy Ltd., January 2003

3.4 The strengthening of social links

In addition to the increased feeling of security it procures, mobile telephony contributes, even more than fixed telephony, to the strengthening of social bonds, in particular when it comes to relations with close relatives and friends. A large part of mobile calls are intended to people whom the mobile user meets often and who live nearby. Mobile calls tend to be shorter than fixed calls and, even though increasing, the share of international calls in the total of mobile close is still quite low. Most mobile to mobile calls are on-net calls, probably due to a “clan effect”.

Advice from friends and family is one of the main factors taken into account by individuals when choosing their mobile operator and since in addition to that mobile operators have implemented special pricing schemes for on-net calls, friends and family members tend to choose the same operator.

Figure 22 : Western European outgoing cellular traffic flows (2001 and 2003)



Source : Strategy Analytics

The recent evolution of lifestyles and family relationships has certainly influenced the usage of mobile phones. Since more and more women work and the duration of children's studies, as well as of their “financial dependency”, has increased families live under the same roof longer. Thus family members remain in close touch longer while they become more and more “autonomous” via different activities and social relations. The mobile has become a personal communication tool allowing to reconcile family life and autonomy.

The mobile phone also contributes to the management of family relationships which have become more complex as a result of the break-up of the traditional family unit. In 1998, in a country like France there were 660 000 single-parent and “recomposed” families. The mobile phone permits direct communications between children and parents without going through a third party.

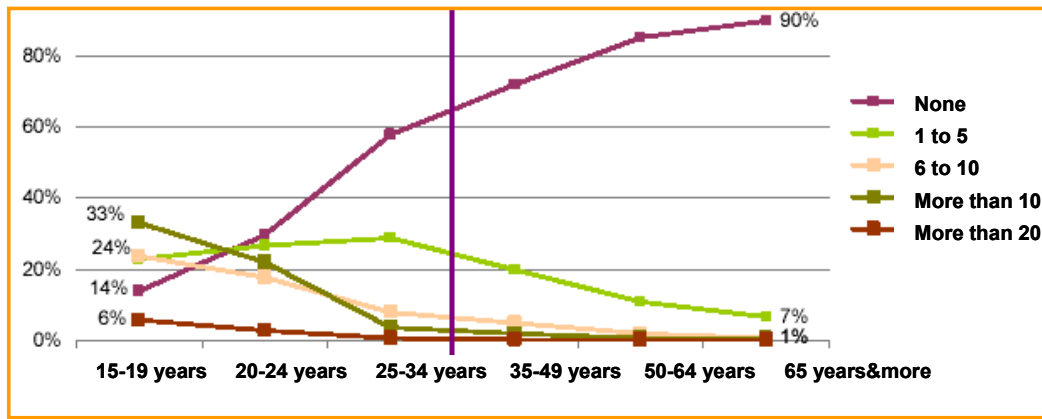
Furthermore, short text messages also contribute to the strengthening of social bonds in particular when it comes to young people. “In many industrialized countries, and in some developing ones too, the mobile has become the principal mode of socializing for teenagers. (...) An important trend recently observed among young people is a distinct preference for SMS over voice calls”³⁶. In 2002 in France 200 SMS were sent every second day and night. Nearly 80% of national SMS users were young people under the age of 24. In many cases

³⁶ Srivastava L., Social and human considerations for a more mobile world, Background paper, ITU, February 2004

short messages represent as much as 50% of their mobile phone bill. According to a survey conducted in the UK more than 80% of young people under the age of 25 are more likely to send text messages than to call.

Young people have adopted text messages to express feelings that they did not dare to say and to mark their adherence to a group. This latter element explains the development of a new language for text messages which differentiates the various groups as well young people from adults. Short messages are also used to avoid disturbing people and because they can be stored. Furthermore, in the framework of exchanges between children and their parents, children prefer to communicate by SMS since they view them as less “authoritarian” than traditional oral communications.

Figure 23 : Number of SMS sent by week in France by age group (2001)



Source : TERA Consultants

Short messages are also widely used by hearing-impaired people who consider that the SMS brings them closer to hearing persons.

Moreover, the usage of short messages tends to increase in the professional and “public” sphere as well. Banks use them to strengthen the links with their customers. “Some governments (...) are considering both e-voting and m-voting for future campaigns. Since March 2002, mobile users in the world’s largest market, China, can directly send SMS messages to the 2 987 deputies of the National People’s Congress³⁷. In India devotees can dispatch a prayer by SMS and the press office of the Holy See sends “thoughts for the day” derived from the Pope’s speeches and homilies to signed-up users.

³⁷ Srivastava L., Social and human considerations for a more mobile world, Background paper, ITU, February 2004

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