



ITU/MIC WORKSHOP ON SHAPING THE FUTURE MOBILE INFORMATION SOCIETY

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SOCIAL AND HUMAN CONSIDERATIONS FOR A MORE MOBILE WORLD

BACKGROUND PAPER

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Table of contents

1	Intro	Introduction	
	1.1 1.2	Context	
2	Mob	bile and identity	7
	2.1 2.2 2.3 2.4	Belonging and the self The fashionable mobile Mobile, gender and youth Identity management for a mobile world.	10 11
3	Mot	bile and social interaction	20
	3.1 3.2 3.3 3.4	The interplay between the public and private spheres of life Individual responsibility and the illusion of communication Love and dating with a mobile Mobile entertaining	22 24
4	Mot	bile and the workplace	27
	4.1 4.2 4.3 4.4	Living to work Working on the move Mobile opportunity Tracking the mobile	29 30
5	Mob	bile wellness and safety	33
	5.1 5.2 5.3 5.4	Mobile health applications and concerns. The environment and the mobile. Mobility and emergency services. Protecting mobile minors.	35
6	Con	elusion	39

1 Introduction

In recent years, the world has seen an explosion in the growth of information and communication technologies (ICT), and particularly mobile communications. 2002 marked a turning point in the history of telecommunications in that the number of mobile subscribers overtook the number of fixed-line subscribers on a global scale, and mobile became the dominant technology for voice communications. Indeed, the mobile phone has moved beyond being a mere technical device to becoming a key "social object" present in every aspect of our daily lives. Always-on connectivity and mobility will define not only the future technological landscape, but equally the socio-political one.

With the spread of "anywhere, anytime" communication infrastructures, comes increased convenience, better access to information and streamlined business processes. The capacity of current and future technologies to enter the private sphere of human lives, however, is correspondingly enhanced. This paper begins with a brief overview of the development of mobile around the world, before exploring the societal and human implications of advances in mobile technology, and particularly its increasingly personalized nature. This will include a discussion of matters such as child protection, data security, health considerations and nuisance factors. The discussion is divided into four key areas influenced by the use of mobile technologies: social interaction, identity, the workplace, and health and safety.

1.1 Context

This paper is one of two briefing papers to be presented at the New Initiatives Workshop on "Shaping the future mobile information society", held 4-5 March 2004¹, and jointly hosted by the International Telecommunication Union and the Republic of Korea's Ministry of Information and Communication.² Country-specific case studies have also been prepared, on Japan, Korea, Morocco and Norway.

1.2 A more mobile market

1.2.1 What's in a name?

The mobile phone is probably the most talked about consumer product in the last 50 years. The term "mobile" comes from the Latin "mobilis", which has the following meanings:

- Easy to move, movable, loose, not fixed, not firm;
- Pliable, nimble, flexible, agile, swift and rapid.
- Readily changing its expression. Able to change one's social status.
- In a negative sense, inconstant, fickle and changeable.³

There is much to be said about its technological, economic and social significance. Today, the smallest mobile has more computational power than the largest computers had a generation ago. And this computational power is only set to increase. No wonder the mobile has been adopted at a staggering rate across cultures and nations. The Americans refer to it as a "cell"; the Germans use the term "handy" which it certainly is; the Japanese use "keitai" which simply means phone; in China it is referred to "sho ji" or hand machine; in Arabic it is sometimes called "makhmul" (referring to the act of carrying). Whatever its name or its nickname, human beings have developed a fascinating relationship with the mobile phone, one that certainly bears further study.

1.2.2 Mobile overtakes fixed

As mentioned above, 2002 marked a turning point in the history of telecommunications, as the number of mobile subscribers overtook the number of fixed lines worldwide (see Figure 1.1). The rise of mobile telephony to overtake fixed has a host of implications, but perhaps the most significant impact is on access, both to basic telecommunication services, and to ICTs, as a tool for economic and social development. It is also noteworthy that the phenomenon of the mobile cross-over has taken place across geographic criteria such as countries, regions, and continents, across socio-demographic criteria such as gender, income, or age, and across economic criteria such as price premium for mobile (micro) or GDP per capita (macro). The

economy with the highest penetration is Taiwan, China, at over 106 per cent. Luxembourg and Israel are in second and third place respectively. Hong Kong, China and Italy complete the "top five" list (see Figure 1.2). Overall, the Asian region boasts the highest proportion of the world's mobile users, 39 per cent (Figure 1.3). The first third-generation mobile networks (under the IMT-2000 standards family) were launched in 2001 in Japan and Korea. The year 2003 saw a number of additional third-generation networks launched, particularly in Europe. Already, research and development efforts are well under way for systems beyond IMT-2000.⁵

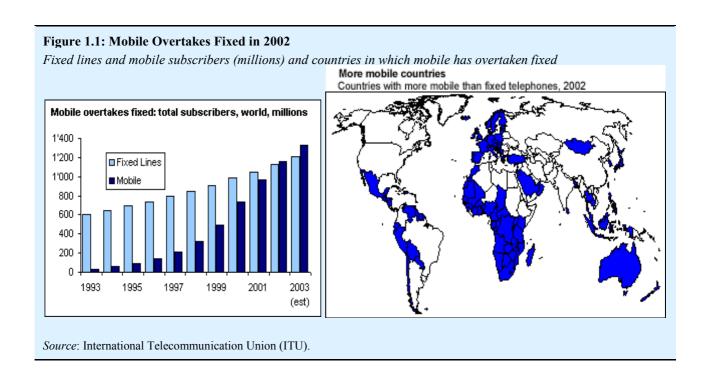
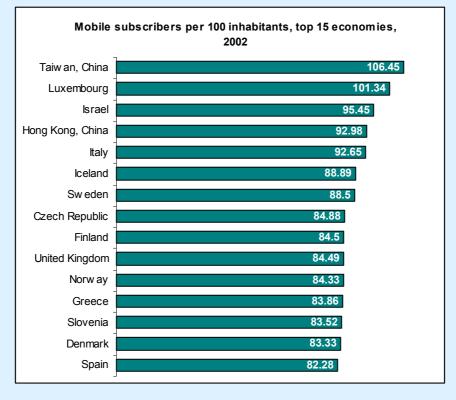


Figure 1.2: Top mobile economies

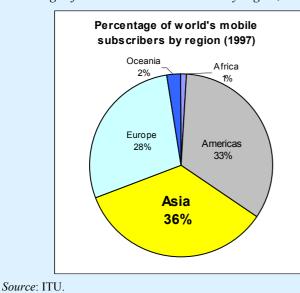
Leader economies in terms of mobile penetration, year-end 2002

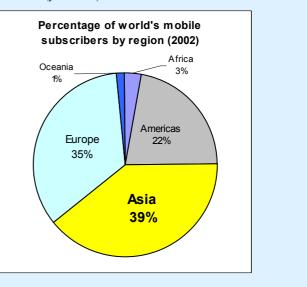


Source: ITU.

Figure 1.3: More mobile: Asia in the lead since 1997

Percentage of world's mobile subscribers by region, 1997 and 2002 (year-end)





6

2 Mobile and identity

This section explores the impact of mobile phones on human identity. The Oxford English Dictionary defines "identity" as follows:

- 1. The quality or condition of being the same in substance, composition, nature, properties or in particular qualities under consideration. Oneness.
- 2. The sameness of a person or thing at all times or in all circumstances; the condition or fact that a person or thing is itself and not something else. Individuality. Personality.

It has been remarked by many that the expanded or enhanced social networks afforded by mobile phones has created a new sense of identity for various groups of people, e.g. teenagers. At the same time, the highly personalized nature of the mobile phone has meant that its form and use have become important aspects of the individuality of a phone user. Banking on this trend, many manufacturers are embedding the latest fashion trends into their mobile handsets, and providing a wide array of services for users, personalizing their phones (e.g. mobile wallpaper, ring tones, coloured phone covers etc...). Identity management is also fundamental to the development of the future mobile information society: the right balance between the release of a user's identity and the protection of his or her privacy needs to be struck early in the development of commercial services.

2.1 Belonging and the self

The search for a sense of belonging has always been an important human struggle. There are four classic facets to the sense of belonging: place, family, country and race. Mobile technologies have certainly had an impact on the first two.

With the advent of anywhere, anytime mobile technologies, the sense of belonging to *place* may slowly be giving way to a sense of belonging to a communications network: "those emotional elements that are lost in the relation with space are transferred to a social level, that is loyalty, the sense of identification, familiarity, stability, security, and so on". Mobile phones allow users to construct their own "at-home" environment regardless of where they find themselves in physical space. With the fixed line phone, an incoming call rings at a place, no matter which person is being called. With the mobile, a person is being called regardless of place. The home or the office, therefore, is no longer the portal to the person – the person becomes the portal.

The collective identity of a *family* or people living at the same place, has been diluted through the use of member's individual mobile phones. In other words, unity has given way to a multiplicity of channels. With the decreasing use of a central fixed line telephone, parents for instance, speak less to their children's friends and classmates than they did in the past, as these communicate directly via their mobiles. Spouses can also be contacted directly and privately on their mobile phone, by their respective friends and family. Thus, the identity of the family unit becomes less about "oneness" and more about "many-ness". This has both positive and negative implications. It is said that the mobile is contributing to the fragmentation of the household, but it also encourages individual thought and external support networks for family members (e.g. abused children or spouses). Furthermore, the collective identity of networks is becoming more pronounced. Mobile users are not only part of a technological network, but also of an important social one. Users can choose other users to include in their network(s), and thereby construct their own mobile identity. This social network is in constant evolution. For instance, one teenage girl in Japan reported that she changed her mobile handset and phone number every three months, because that is how fast her social network (set of friends) changed.

Never before has a technical device become such an important aspect of human lives, and a determinant so powerful of individual identity. Indeed, users are getting closer and closer to their mobile phone and at all times of the day. A large number of people use their mobile phones as their alarm clock and sleep with their phone under their pillow or on their bedside table. The Japanese have recently released a mobile phone that enables users to listen to calls inside their heads, by conducting sound through bone⁸. 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. Both physical and emotional attachment to mobile handsets is increasing (see Box 2.1). Many are afraid to leave home without it, and feel uncomfortable when others peruse their mobile menus or messages.

In a 2003 UK survey, 46 per cent of mobile phone users described the loss of their mobile as a form of "bereavement". For many users, the thought of having their mobile phone privileges revoked can cause indignation and even protest (see Box 2.2).

Box 2.1: How I feel about my mobile phone

Quotes from UK mobile users cited in O2 and Demos Report "Mobilisation"

- 1. "I keep mine under my pillow" (Female, Ravensbourne School)
- 2. "I love my phone. It's my friend" (Female, 32, teacher)
- 3. "I save messages, like I save sweet things from my wife. They're good to look at sometimes" (Male, 34, IT Manager)
- 4. "I always phone friends' mobiles before their parents' landlines now" (Male, 18, student)

Source: "Mobilisation: The Growing Public Interest in Mobile Technology", 2003.

The UMTS Forum concluded in its 2003 paper *Social Shaping of UMTS*, that users have a more "emotional" relationship with their mobile phones than with any other form of information and communication technology. ¹⁰ Not surprisingly, mobile users often use "emoticons" (or diagrammatic representations of emotional states such as a smiley face) in communications with each other. The use of "smiley faces" and the like to express feelings through text is notably higher in mobile messaging than in email. In Japan, this is known as the "face letter" or "*kao moji*", and mobile users have a staggering array of face letters to choose from.

Box 2.2: My mobile phone is my right

Restriction on mobile phone use and ensuing protest by UK jockeys

On 1 September 2003, the Jockey Club issued a restriction order on mobiles in racetracks in September 2003, in order to prevent the leaking of inside information to third parties.

This was met by protests on the part of the jockeys, who were quoted as saying the following:

"We all have very busy schedules, meaning managers and trainers and family need to get hold of us"

"... there was very little cheating in horse racing and restricting mobile phones was not the answer anyway"

Even bookmakers agreed with comments such as "Everybody uses mobile phones in this day and age to contact everybody else and I think to say they can't use them wouldn't stand up in court"

Source: BBC News, 2 September 2003, http://news.bbc.co.uk/2/hi/uk_news/england/norfolk/3202613.stm.

2.1.1 Cultural and political identity

The effect of mobile phones on cultural and political identity, which are sub-sets of collective identity, cannot be overlooked. In his book *Smart Mobs*, Howard Rheingold describes "thumb tribes" and "the power of the mobile many". In this context, he explores the power of masses engaged in the furtive exchange of SMS messages. He cites a group of mobile phone users in Stockholm, for instance, who exchange SMS messages while on the public transport system in order to avoid fines for ticket-less riding. These mobile fare jumpers alert each other to spot checks by transport officials by sending out short messages to a distribution list. The use of SMS has also been cited as partly responsible for the overthrow of President Joseph Estrada of the Philippines. Mass political protests, such as those related to WTO meetings, have also been organized quickly and effectively via SMS. In March 2003, trade associations in India decided to protest against value-added tax launching an SMS campaign. The campaign was launched by 100-odd trade association members and the strategy was akin to the age-old "chain-letter" system: each trader was asked to send at least 10 messages from their mobile phones to other numbers, telling the recipients about VAT and how it would affect both traders and consumers. Local political campaigns can also benefit from mobile technologies, by using messaging to send out electoral propaganda.

The use of mobile has the potential to facilitate assemblies of unrelated people at a moment's notice (see Box 2.3). In the past, these assemblies would take a significant amount of time to orchestrate, and information about them could spread to third parties, including authorities before they were to be held. This may increase the rapidity of political change and open up varying paths of political development, but at the same time raises concerns relating to social order.

Box 2.3: Flash Mobs

A new form of social assembly

The first flash mob occurred in June 2003, in the carpet section of Macy's department store in Manhattan, when 200 "flash mobsters" expressed their desire for a 15'000 USD love rug for their homes. Since then, due to the use of email and the instantaneous medium of mobile messaging, this phenomenon has spread across the globe, to Asia, South America, Europe etc...

Flashmobs UK defines a flash mob as "a large group of people who gather in a usually predetermined location, perform some brief action, and then quickly disperse". Over 200 odd flash mobs have occurred worldwide since June 2003.

The principle is simple. Anyone can organize a flash mob and anyone can participate. The first step is to find a website such as www.flashmobs.co.uk and join a flash mob group. Mobsters can broadcast messages about a flash mob they wish to organize, or simply wait to hear about the next event. Typically, events are scheduled no more than a few days in advance, the objective being maximizing surprise and fun, in minimum time. The gatherings are peaceful and usually centre on a theme. Last minute details are almost always broadcast by SMS.

Source: www.flashmobs.co.uk; The Age, Australia, September 2003, http://www.theage.com.au/articles/2003/09/01/1062403447291.html.

Mobile phones have flattened traditional hierarchical structures and enhanced the accessibility to political institutions, allowing individuals to vote or to lodge complaints with authorities directly. Some governments, such as that of Hungary, have conducted SMS elections, following the lead of popular TV shows, e.g. *Pop Idol*. Others are considering both e-voting and m-voting for future campaigns. Since March 2002, mobile users in the world's largest mobile market, China, can directly send SMS messages to the 2'987 deputies of the National People's Congress. The new service lets people test the bounds of a new freedom of expression in China, where politically charged jokes have begun to spread like wildfire from the Internet to mobile phones.

The influence of mobile phones on religious and cultural practices is also notable. With the mobile being such an integral part of everyday life, today it has even become a medium for prayer. A good example of its use in this sphere is in India, where devotees can dispatch a prayer via SMS (see Box 2.4). In Morocco, Méditel offers a discounted mobile phone roaming service in Saudi Arabia, during "Haj", the pilgrimage to Mecca. During this period, the receipt of SMS messages is free and incoming calls and outgoing texts are offered at discount rates¹¹. Even the Pope has turned to texting to get his message across. The messages are sent from the press office of the Holy See, the central authority of the Catholic Church within the Vatican. Signed-up users receive SMS "thoughts for the day" derived from the Pope's speeches and homilies. Services are available in Italy, Ireland and the United Kingdom. In the UK, each message costs the user 25 pence, and this is shared between the network operator, the Vatican and Italian technology provider Acotel.¹²

It is not only in mobile applications that this interplay between culture and technology is being witnessed, but also in hardware design: a Korean manufacturer recently developed a mobile phone exclusively for the Muslim user (see Box 2.5).

Box 2.4: Praying by SMS

Busy Indians are jumping the temple queues during one of Bombay's biggest Hindu festivals by making their offerings through SMS. For a fee of 51 rupees (1.12 USD) plus the traffic charge, devotees can SMS the word "PUJA" (word meaning prayer) to the BPL Mobile cellular operator to have prayers said for them at the city's most popular temple. After the prayer, the temple sends the BPL customer a receipt, special offerings and a portrait of Ganesha.



A portrait of Ganesha

Source: Reuters (Asia).

Box 2.5 Mobile phones helping the faithful find Mecca

LG Electronics (LGE) has created a buzz in the mobile phone industry after developing a device that especially caters to the religious and geographic needs of the huge Middle East Muslim market.

Muslims perform Salat (prayers) to Allah in their prescribed ritual five times a day - at sunrise, noon, afternoon, sunset, and midnight. They have to face the direction of Kaaba (the House of Allah) in Mecca, but they have difficulty locating the direction in the desert.

By setting the -5300-compass to the north and inputting their location information, Muslims can now easily find the direction of Mecca. With this feature, the handset positions itself as a specialized functional phone in the Middle East market. In particular, it is expected to spur a boom in the region because the compass may be used even where GPS services are unavailable.

Source: E-Tech Korea, http://www.etechkorea.info/articles/20030921001.php.

2.2 The fashionable mobile

The mobile phone has become somewhat of a status symbol. Some mobile users engage in "stage phoning" or speaking loudly on their mobiles in order to be heard and seen (regardless of whether or not they are on a an actual call). Moreover, the extent and nature of the personalization of the telephone is now essential to individual identity, particularly among the youth. Many young people show off their mobile phones to each other, and their social status is enhanced by the ringing tones they use and the number/quality of messages stored on their mobile phones.

Mobiles are quickly becoming fashion accessories rather than simple communications devices (Box 2.6). Manufacturers now offer a wide array of brightly coloured mobile covers, to change the look of mobile phones depending on the user's outfit. In Japan, mobile users personalize their mobile phone with stickers and colourful beaded accessories. Fashionable wallpaper can be downloaded to enhance the look of the mobile. If that's not enough, "designer mobiles" have appeared on the market, with everything from imbedded precious stones to leather or fur covers for every occasion and mood.

Box 2.6: Nokia helps you reveal your hidden self

Getting up close and personal with the Nokia "medallion" series

The mobile handset manufacturer Nokia has entered the jewellery business. Its latest "medallion series" includes chokers or medallions ready to upload digital images that can be taken by mobile phones. The medallions can store a number of images that are then displayed as a continuous slide show.

Nokia tells us: "...create a stylish backdrop for exposing your persona, whether demure or outrageous. So go ahead: reveal your hidden self".





Source: Nokia.

2.3 Mobile, gender and youth

2.3.1 Gender

As mentioned above, mobile phones can result in the flattening of traditional hierarchical structures. In this context, they have the potential to equalize the capacity of social integration of men and women¹⁴. In many cultures, women are now more avid users of mobile phones than men, both for voice and text¹⁵. The introduction of the mobile phone has also facilitated the balancing of professional and domestic life, a boon for the working mother. This will be further enhanced by video-conferencing and location technologies, helping users keep in touch with family members (for an example, see Box 5.8).

Mobility is highly individualized. Typically, men carry mobiles in pockets, whereas women carry them in purses or bags. Women, particularly, see mobiles as a "shield" against unwanted attentions¹⁶.

As early as 2001, NTT DoCoMo in Japan launched the i-Lady service, which saw women to use their mobile phones as ovulation monitors, in order to help them conceive children. In the UK, mobile phones are being used as tools to help teenagers have access to services such as the morning-after-pill (see Box 2.7).

Manufacturers are also starting to capitalize on the female market, aiming to sell phones that look more like jewellery and less like toys, and are even including standard functions that might appeal to the female market, such as thermometers or calorie counters. Samsung's T500 is a good example (see Box 2.8).

Box 2.7: Mobile the morning after

Mobiles help young girls with sexual health

Teenage girls will be able to use their mobile phones to access the morning after pill when a controversial pilot scheme gets underway in Tyneside (United Kingdom) in December. The scheme will provide a help line number to girls who suspect they are pregnant. After leaving their mobile phone number, they will receive a text message detailing an appointment - within 24 hours if necessary - with a doctor or nurse, who will supply them with the morning-after- pill and offer advice on sexual health.

Source: BBC News, October 2003, http://news.bbc.co.uk/2/hi/uk_news/england/tyne/wear/3227149.stm.

Box 2.8: Mobiles with a feminine touch

Manufacturers aim at the female market

Samsung has recognized the importance of the female market. Its recently released T500 handset reflects this. It describes the phone as follows "Like a bride's wedding gift, the T500 excites women and insures happiness, with its sleek, slim, compact design, and velvety finish". The phone comes with a sleek dial on the cover and 32 shining diamond-like cubic zirconium.



The Samsung T 500

Internal features also include important health monitoring devices, such as:

- Biorhythm check: Checks physical, emotional and intellectual well-being on a daily basis;
- Fat index: Calculates fat levels easily, by accounting for height and weight;
- Calorie Counter: Checks and monitors calories burned by daily activities and exercise;
- Pink Schedule: Computes potential pregnancy periods by tracking the dates of the user's menstrual cycle.

Source: Samsung, see http://www.samsung.com/Products/MobilePhone/GSM/MobilePhone GSM SGH T500.htm.

2.3.2 Youth

Young people are certainly the most enthusiastic users of mobile phones. Mobile users seem to be getting younger and younger every day. A recent survey found that 56 per cent of Italian children aged nine or ten own a mobile phone (see Box 2.9). And in the UK, there were 400'000 children under the age of 10 owning a mobile phone as of August 2003, up from 80'000 in 2000. As mentioned above, the proportion of Japanese girls owning mobile phones under the age 18 has reached almost 100 per cent.

Box 2.9: The young and the mobile in Italy

56 % of Italian nine and ten-year olds own a mobile phone

A University of Trieste survey of Italian children aged between 9 and 10 found that 56 per cent owned mobile phones. Of these, 68 per cent never switched their phones off, 80 per cent kept them on in church, and 86 per cent kept them on during lessons. Typically, the mobile phones were given to the children by their parents or guardians. 40 per cent of calls were made to their guardians. Finally, of the 44 per cent of children aged 9 and 10 that did not own a mobile phone, 100 per cent said that they would have liked to own one.

Overall penetration of mobile phones in Italy is one of the highest in the world at 92.7 per cent.

Source: Guardian Unlimited, http://www.guardian.co.uk/italy/story/0,12576,994515,00.html, ITU.

Indeed, mobile phones have now become determinant of whether a young person is in the "in" crowd or not. Many teenagers don't recognize the difference between speaking on their mobile phone and meeting face to face. In many industrialized countries, and in some developing ones too, the mobile has become the principal mode of socializing for teenagers. Young people use the mobile primarily to sustain and enhance their social networks. It allows them to maintain their status, in terms of age, gender, class, peer group and so on. Moreover, the ownership of a mobile is an important step in a child's process of becoming independent from

its parents and teachers: it is a medium for the assertion of its own identity and autonomy. Young users are, not surprisingly, more likely to personalize their mobile phone, through ringing tones, wallpaper and covers than their adult counterparts.

An important recent trend recently observed among young people is a distinct preference for SMS over voice calls. According to a survey by CPP (a mobile insurance company), more than eight out of ten people under the age of 25 in the UK are more likely to send someone a text message than to call. There are a number of reasons why young people may prefer text to voice. For instance, in many cases it is less expensive. The text message is secret and secure - it cannot be intercepted by anyone else. Texting is also seen as an easier method of communication for people who may be shy or who find themselves in awkward situations. The text can serve as a warning to a voice call: most young people in Japan invariably text before initiating a voice call, in order to confirm that their interlocutor is able and willing to speak with them. Teenagers can also use short messages at all hours of the day and night, without the knowledge (or interference) of their parents and guardians. Before mobile phones, teenagers were prevented from being in communication with their peers after bedtime. This has since changed: "good night" text messages are very common among children and adolescents, providing a virtual network of peers late into the night.

While the majority of adults may tend to use texting primarily for practical arrangements (appointments etc.), teenagers use texting as a medium to express a wide spectrum of emotion and feeling. Young couples text each other romantic poems or even argue through lengthy exchanges of short messages. In this context, some analysts have highlighted the "gift nature" of mobile texting. Teenagers tend to save mobile messages they cherish on their mobile phones. Text messages are a form of gift, in that they have value, which "is connected with the giver, the recipient, and the context in which the exchange takes place, and is embodied and retained in material form". Young users are proud of the SMS they have stored in their phones. They often re-read positive messages from loved ones and peers, and keep those messages in reserve that might come in handy in a future argument with a partner or friend. This trend is also showing signs of developing in the adult world see(Box 2.1).

Mobiles in schools are now widespread, so much so that schoolteachers and administrators are concerned about its effect on discipline in the classroom. Students have been observed in classrooms texting under their desk or even defiantly during a lecture. A number of schools have banned mobile phones altogether. At the same time, text messaging is also being used by adults to reach youth. Parents find texting very useful to communicate with their children, particularly in terms of ensuring their safety and establishing times and location for pick-up. In schools, it can be used to discourage behaviour such as truancy (see Box 2.10). In countries like Australia and Malta, even school examination results are even being delivered to students via SMS.²⁰ In South Africa, one university professor is even using SMS to administer pop quizzes.²¹

Box 2.10: Dial SMS for Truancy

Schools use short message service to fight absenteeism

Portmarnock Community School and Manor House School in a Dublin suburb use computerised database to record students who miss classes or lessons. The system automatically sends out a text message to parents when children miss morning attendance. The system has been introduced to comply with new legislation, which requires schools to notify parents as to the whereabouts of their children.

Parents may choose to ignore the SMS alert from the school, if the absence of the child from school is legitimate, or if required, take action immediately. The use of the text messaging facilitates the task of both the school and the parents.

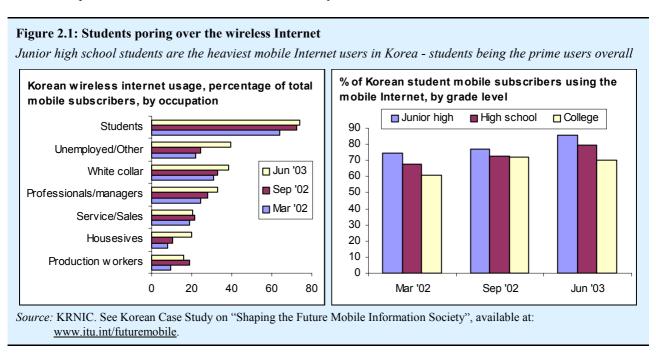
Source: Ananova.com, May 2003, http://www.ananova.com/news/story/sm 779158.html.

The nature of SMS and its overwhelming popularity has led to the formation of a new language for texting, particularly among the young. Due to the limited number of characters each SMS allows (160), mobile users have been forced to become rather creative in using fewer letters or symbols to convey meaning. Box 2.11 sets out some common examples of texting abbreviations and symbols. In fact, young peer groups often differentiate themselves by the type of abbreviations they use while texting, forming a type of texting "subculture". This popularity of texting among the young is having an impact on their ability to spell and

conjugate verbs, but the trend shows no sign of waning. The language of text has become so common, in fact, that SMS abbreviations have recently made their appearance in the Oxford English Dictionary.

Box 2.11: The language of text New abbreviations and symbols for mobile texting are popping up in a number of different languages. Below are some examples of English texting abbreviations, and a selection of "emoticons **ASAP:** As Soon As Possible BCNU: Be Seeing You BC: Because BTW: By The Way CU: See You GR8: Great L8: Later LOL: Lots of Love/Laugh out Loud M8: Mate U: You **PAW:** Parents are watching PLS: Please TKS: Thanks URA*: You Are A Star WBS: Write back soon WKND: Weekend W/O: Without 2MOR: Tomorrow :) Happy ;) Winking (joke or flirt) :(Sad : 0 Surprised <:) Happy with a hat ;-& Speechless Source: ITU.

Not only is texting a craze among the young, but the use of mobile Internet applications is also more popular with them relative to adults, especially in industrialized Asian countries. In Korea, for instance, students in general use the wireless Internet more than the general public, but the younger junior-high school students seem to be the most avid users (see Figure 2.1). As these young users grow, it will be interesting to observe whether their habits change or remain the same. Certainly, their use of the technology provides telling clues as to the shape and form the mobile information society will take in the future.



2.4 Identity management for a mobile world

2.4.1 Managing commercial identity

Many developments are under way to transform the mobile phone from a pure person-to-person communication device to an electronic wallet and identification system. The objective is to open up a number of convenient commercial services to the mobile user. This requires the establishment of secure transfer of a user's identity and financial information.

For instance, services enabling customers to buy tickets for shows and events have popped up in a number of countries, particularly in the Asia-Pacific region, such as Australia (see Box 2.12). In Japan, PIA Corporation has developed a system whereby subscribers use a "digital pocket" for purchasing and storing tickets on their mobile phone. The "Digi-Pocke" functions as a virtual pocket in cyberspace: it saves the reserved ticket, to be read at the gate, or can facilitate the transfer of tickets between users in a secure manner. Users are able to pay for tickets through secure e-banking channels between PIA and their banking institution.

Box 2.12: Mobile ticketing down under

Mobiles allow users to buy tickets for events securely, avoiding queues and hassle

UK company Mobiqa has licensed a "mobi-tickets" technology for distribution in the Asia-Pacific region. Mobi-tickets works by sending a bar code to a mobile phone as a picture message, and this bar code can be read or scanned by a typical point-of-sale system. In case the handset cannot display the picture message, a unique 'ticket' number is sent to the user via SMS, which is manually keyed in by event staff.

Mobi-tickets were first launched in Sydney in The Metro Theatre, which used them to deliver tickets for performances by bands such as Echo and the Bunnymen and Killing Joke.

Source: CNET News, November 2003.

Mobile ticketing is a first and important step in the development of a "commercial" identity for mobile users. The application of authentication technologies (such as encryption or biosensors) in mobile phones will further widen the scope for mobile commerce. Some technologists predict that the personal mobile phone is set to evolve into the principal identification and payment method of the future. The "mobile phone" (or its equivalent) of the future could allow users to convert any public terminal into a personal information and communication station, conduct mobile banking transactions, pay for groceries without having to queue, open locked doors or secure gates, ride public transport (see Box 2.13), and receive timely and location-specific information. It is therefore essential for operators and manufacturers alike to carefully consider the security parameters for establishing commercial identity, and safeguarding it.

Box 2.13: Smart commuting?

London's Oyster Travel Card and Tokyo's Felica Card facilitate smooth commuting for those wishing to release information about their whereabouts

London has introduced a new system known as the 'oyster' card to make commuting on its public transport systems more efficient. Each card will have a unique ID number linked to the registered owner's name. The "contactless" card can then record the location and time of use. Those wishing to buy a monthly or annual season ticket will have to register their details with London Transport. Those wishing to pay per journey will not be required to register, but will have to pay higher rates of transport.

Similar smart card systems have been introduced in other parts of the world, such as Hong Kong, Germany and Singapore. In Tokyo, the "Felica" card is be embedded in mobile phones in order to make commuting even more efficient for travellers.

However, civil rights groups are concerned about privacy implications. Data relating to individual commuters, including dates, time location and frequency of travel may be retained for business purposes over months and even years, and may under certain conditions, be released to law enforcement agencies.

Source: BBC News (September 2003 - http://news.bbc.co.uk/2/hi/technology/3121652.stm), Sony Japan.

2.4.2 Protecting identity: Concerns over privacy

Identity and privacy are forcibly linked. The human right to privacy has two important aspects: a) freedom to control personal identifying information and b) freedom from interference or disruption.

2.4.2.1 Safeguarding personal information

The phenomenon of "Flash Mobs" mentioned above, and in general, the mass distribution of targeted information via SMS, has important implications for what might be termed "interpersonal surveillance". Although the term surveillance has typically been associated with activities of the state, it can be used to look at "mobile information gathering and communicative availability".²³ Social groups can track the

whereabouts of particular individuals, and communicate this information instantaneously and directly to members of a large network. A good example is the SMS tracking of Britain's Prince William at his university (see Box 2.14).

Box 2.14: Poor Prince William

Tracking royalty via SMS

Britain's Prince William is faced with frequent onslaughts from fellow "star-struck" students at his university, the University of St Andrews in Scotland. A sophisticated text messaging network has materialized, automatically distributing information about the Prince's whereabouts. Whenever he is seen about town, messages are sent out about his location to a small group. The text messages are then forwarded to an ever-growing number of young girls, meaning that information about Prince William's activities can take just seconds to reach over a hundred royal-watchers. Poor Prince William is most likely dreaming of better days when mobile phones were only in the hands of the chosen few.

Source: Guardian Unlimited, http://www.guardian.co.uk/online/story/0,3605,984712,00.html.

The widespread use of mobile phones, combined with their intrinsically personalized nature, has also meant that an increasing amount of information is now being stored on handsets: messages, phone numbers, notes, calendars and so on. In the case of loss or theft, users stand to lose a mine of private information. Manufacturers are now attempting to introduce systems to back up data contained in mobile phones; for instance, by introducing combination mobile and PDA handsets. However, the availability or release of that personal information to third parties remains a concern, e.g. the case of theft or unauthorized access. Operators, for instance, retain information on the calls, messages and location of their users, for years. This information can be made available to law enforcement agencies in the case of legal action. Yet in most countries, clear and transparent guidelines on storage and release of this information have not yet been defined. It remains unspecified what third parties may have access to the information, and the duration service providers may retain it. Unless clear limits are placed on the storage and use of personal information, particularly by the state, there may be resistance in the take-up of new technologies, such as 3G and location-based systems. This holds particularly true in the current climate of terrorism, in which governments are reluctant to dilute any power they may have to monitor individuals and groups.²⁴

In the case of theft or loss, personal information stored on the handsets of users can also be subject to misuse. In this regard, recent developments for protecting handsets have included physical authentication methods. In Japan, in the summer of 2003, NTT DoCoMo launched its F505i handset, which comes equipped with a fingerprint sensor (see Box 2.15). This function prevents unauthorized users to access any information on the mobile phone or make calls.

Box 2.15: Let your fingers do the locking

NTT DoCoMo's (Japan) handset with fingerprint sensor

To safeguard the increasingly private nature of information contained on mobiles, manufacturers are looking into methods of increasing handset security. In July 2003, Japan's Fujitsu released a handset with fingerprint authentication technology for operator NTT



F505i (DoCoMo/Fujitsu)

The handset's fingerprint sensor prevents unauthorized handset use. The user can lock or unlock the mobile phone by simply placing a "pre-registered" finger on the sensor. Up to 10 fingerprints can be registered per mobile handset.

Source: NTT DoCoMo, ITU Japan Case Study on "Shaping the Future Mobile Information Society" available at: www.itu.int/futuremobile/.

2.4.2.1.1 Mobility and camera phones

The first camera phone was launched by J-Phone in Japan in October 2000. Since then, the number of camera phones has skyrocketed. According to a report by the ARC Group, more than 55 million customers worldwide owned mobile handsets with digital cameras by the end of 2003, compared to the 25 million camera handsets sold in 2002. Many predict that the digital camera will be become a standard feature of mobile phones. The quality of digital images captured by camera phones has also been substantially enhanced, from the original 110K pixel cameras to the recent release of 2 mega-pixel mobile camera phones in Japan and Korea.

With camera phones, users can snap pictures of famous sites and celebrities but also of things or people they find beautiful or funny, strange occurrences, or everyday events. The portability and discreet nature of camera phones means that pictures can be taken quickly and unbeknownst to the photographed. For this reason, camera phones are being banned by various companies around the world, because they are seen as a threat to either corporate security or the privacy of clients. Governments such as Saudi Arabia have outlawed camera phones throughout the country. Even Korean handset manufacturer Samsung has banned camera phones from their factory. Table 2.1 sets out some of the actions taken against camera phone use in selected countries.

Similarly concerned, mobile manufacturers are taking steps to ensure that mobile users respect the privacy of others. In one of the most advance mobile markets, Japan, all camera phones emit an audible sound when a picture is taken - a self-regulatory effort on the part of manufacturers and operators. Following suit, the South Korean government has ordered manufacturers to ensure that all new handsets emit a beep (of at least 65 decibels) whenever a picture is taken.²⁶ The Government was pushed into action after a number of incidents, including one case in which a woman used her camera phone to snap a naked woman in a popular sauna bath, and then sold the picture to a website.

A combination of the camera phone, multimedia messaging (MMS or messaging with still pictures or video) and the Internet is the "moblog", which is steadily gaining in popularity. The world "moblog" has been coined from "mobile" and "blog". Moblogs are websites on which anyone can post pictures taken with mobile phones, instantly, with or without descriptive text or comment. A large number of personal moblogs already exist on the Internet, typically posting pictures of people's children, dogs, houses or travel logs. But

many are using it as an outlet for amateur photojournalism, particularly after major events. For instance, moblogs were swamped with pictures from mobile users during the historic blackout in August 2003, when sixty million people were left without power in the Midwest, the northeastern parts of the United States and some parts of Canada. Even though many people could not use their mobile telephones to make calls, they were able to send data. Some captured images of the black out and posted them to the web, available for those around the world to view²⁷. This has positive implications for sharing information over a worldwide network and for encouraging human creativity. But the increasing use of camera phones and the moblog phenomenon also mean that photos of people can be posted without their consent, and worse, to their detriment.

Table 2.1: Early restrictions on the use of camera phones

Selected action against camera phones

Country	Who/what?	Details
Sweden	Volvo	Banned from most of the factory
Germany	BMW	Banned from most of the factory
UK	Rolls Royce	Banned in principle
UK	British Aerospace	Banned in principle
UK	David Lloyd	Banned in principle
Australia	YMCA swimming pools and health clubs	Banned from changing rooms
Saudi Arabia	Government	Outlawed in entire country
United States	Movie previews	Reviewers asked to leave camera phones outside viewing hall
Japan	Tipness Fitness	Banned from changing rooms
Korea	Samsung	Banned from semiconductor, flat-panel and electronics factories

Source: Adapted from Mobile Messaging Analyst, July 2003.

In Europe, the first governmental authority to act with respect to camera phones was the Italian Data Protection Authority (GPDP). In the first half of 2003, the GPDP issued a set of guidelines for the use of camera phones in public places, invoking European laws governing human rights. Under the guidelines, the dissemination of pictures taken with a camera phone without the consent of the person(s) in the photo is forbidden. Anyone who has taken a photo with a camera phone is deemed to be effectively processing the personal data of those in the photograph, and are thereby responsible for ensuring their privacy. Operators have the responsibility to delete photographs that are sent via MMS to legacy handsets. This is an attempt to manage the continual increase of person-generated content available on public networks. The guidelines do not carry the force of law, and authorities admit that it will be difficult to enforce and to police.

It is possible that technology can provide a solution – technology such as Iceberg's "Safe Haven", which can control the use of camera phones in selected areas. Safe Haven works by sending a signal to a camera phone telling it that it is in a designated privacy phone, and switching off the phone's imaging system²⁸. The phone can still be used to make calls. This is a nascent technology and therefore will only work for future generations of phones, but its existence, and the existence of mobile phone jamming technologies, shows the growing concern among public and private actors alike over the use of mobile phones in public places (Box 3.1).

2.4.2.2 The problem with spam

The second aspect of the right to privacy is the right to freedom from interference. In the mobile context, this relates primarily to the growing problem of spam, or unsolicited commercial communications.

Spam is already a significant nuisance in e-mail communications. Many Internet users find their inboxes cluttered with advertisements ranging from debt management and medication to sexual enhancers and dating

services. Governments are attempting to thwart the facility with which marketers can currently send spam mail: the United States, for instance, has recently enacted the "Can-Spam Act" of 2003. But no less than industry, governments are faced with the challenge of striking the right balance between fostering valuable commercial innovations and protecting the rights of users. With the use of location-based technologies, and technologies such as radio frequency identification tags (see Box 2.16), targeted advertising and promotions can reach users at the right time and at the right place. This might prove to be a very useful service for users; but it could also lead to an increase in the number of unsolicited messages appearing on at mobiles. Clear opt-in and opt-out systems need to be put into place.

Spam over mobile networks (through SMS for instance) may pose an even more serious problem than Internet spam, given the personalized nature of the mobile phone, its growing use among young children, and in some cases the cost incurred for incoming messages. People trust the mobile phone more than any other form of information and communication technology. The receipt of unwanted commercial messages may threaten this increasingly private and trusting relationship. And as mobile communications become more and more widespread (or "ubiquitous"), the potential for abuse is correspondingly greater.

Box 2.16: RFID tags and Shopping in Tokyo's trendy Roppongi Hills

RFID tags are essentially tiny microchips, some only 1/3 of a millimetre in diameter, that act as transponders (transmitters/responders), continuously waiting for radio signal to be sent by transceivers, or specially-designed RFID readers. When a transponder receives a certain radio query, it responds by transmitting a unique ID code. Most RFID tags are passive tags, that is to say they are not powered by any batteries. The most important functionality of RFID tags is the ability to track the location of the tagged item. RFID tags can cost as little as 0.50 US cents and the prices are dropping. Some analysts say that RFID will soon replace the familiar bar code in the retail world.

This use of RFID tags at Roppongi Hills in Tokyo has now been expanded to retail shopping: the trial of NTT DoCoMo's "R-click" service began on 1 November 2003 and will run until 1 February 2004. The R-Click service delivers information specific to a user's location using RFID tags. DoCoMo has issued about 4'500 RFID tags (embedded in small handheld terminals), which can be attached to users' mobile phones (see Figure 4.8). 200 stores are already on board for the trial. Subscribers can inform the network that they wish to be located by pushing a button, but the default setting is off. The small, handheld device then enables users to receive a wide variety of area information as they walk around the new metropolitan cultural complex of shops, restaurants, entertainment facilities, residences and hotels.





Source: ITU Japan case study on "Shaping the Future Mobile Information Society" available at www.itu.int/futuremobile/; ZDNet Japan.

Vodafone UK and Japan's NTT DoCoMo are some of the operators trying to combat spam. In August 2003, Vodafone introduced programmes encouraging users to forward unsolicited messages to them free of charge. In the case of Vodafone, it will collate a consolidated report of all the unsolicited text messages forwarded. This consolidated report will be forward to mobile messaging regulators, such as ICSTIS (Independent Committee for the Supervision of Standards of Telephone Information Services). From 25 December 2003,

DoCoMo introduced a new anti-spam measure that will enable its mobile subscribers to block all e-mails from user-selected domains of other mobile or PHS companies. DoCoMo has taken aggressive countermeasures against spam mail sent from its i-mode network, such as limiting the amount of e-mails sent daily from a single i-mode account and suspending or rescinding the contracts of DoCoMo handsets registered to known spammers.

3 Mobile and social interaction

The "technological intimacy" users have with mobile phones means that they carry and use the device wherever they go, in a wide variety of social and professional settings. Indeed, the mobile has equalized the opportunities for communication between the moving and the non-moving person: in the past, those in physical proximity of a fixed-line telephone had an added advantage. The use of mobiles has also made it easier for shy or reserved people to communicate, and SMS has been a big hit with the deaf community. The mobile phone has furthermore decentralized our networks of communication. Communication no longer occurs only from a fixed point to another fixed point: a multitude of different points can now communicate with a multitude of moving or still targets.

This chapter discusses the effect that mobiles, with their decentralization of communication, have had on social interaction. In particular, the blurring of the boundaries between the private and public spheres of life, and the use of mobiles for love and dating, will be explored.

3.1 The interplay between the public and private spheres of life

The pervasiveness of mobile communications in everyday life has meant that the distinction between the public and the private spheres of human existence is less pronounced. Public places are commonly "colonized" by the private lives of mobile individuals²⁹. As Sadie Plant³⁰ has noted, mobiles have created "simultaneity of place": a physical space and a virtual space of conversational interaction. It can also be said that there has been an extension of physical space, through the creation and juxtaposition of a mobile "social space". This has led to a constant "permeability"³¹ between the separate contexts of social life. For instance, individuals have often been observed talking on the phone at a restaurant table, while their dining partner either looks elsewhere or is similarly engaged talking or texting on their own mobile device. The intrusion (or potential intrusion) of remote others, in any given social context, has become commonplace, and even anticipated.

Although in some countries (e.g. Japan), there have been efforts to regulate mobile phone usage in public, e.g. through restrictions on use in restaurants and public transport, in general, the tension between remote and co-present social interaction has not yet led to the establishment of any social norms. For this reason, there is general concern that the use of the mobile phone may be affecting social behaviour. Two areas of complaint stand out:

- 1. The mobile voice: many mobile users tend to speak on their mobiles about very private issues, and more loudly at that, resulting in forced eavesdropping;
- 2. Two places at once: the complexity of managing two sets of social contexts at the same time.³²

While admitting to an overall increase in spontaneous and widespread social interaction, some argue that mobile phones may be reducing the quality of face-to-face social interaction. And the ambiguity regarding the social norms that mobile users are to follow in public or group settings seems to further dilute this quality.

Much of the use made of the mobile phone in public is coupled with a wide set of non-verbal action and interaction.³³ If a mobile phone rings in public and is answered, a couple of responses have been observed. First, the called party typically moves their gaze away from the direction of those present, to a neutral place. In some cases, the called party moves their head downward, turns their upper body, or steps away from those that are co-present. Strangers present typically look at the mobile user briefly and then return to what they were doing. If in a social group, others present often display body language to indicate that they are not

listening in on the mobile phone conversation, i.e. they would speak among themselves, turn their upper body away from mobile phone user, or simply move away.

Many people now choose to text rather than talk with their mobile phone, depending on the social situation they find themselves in. Students sitting in classrooms, or in their room at bedtime, prefer to text. In meetings, many prefer to text in order not to disturb the proceedings. With texting of course, users can continue to engage in conversation with those co-present, while communicating with a distant third party. In Europe and North America, loud ringing tones and mobile conversations are commonplace. On the other hand, in Japanese restaurants and trains, people send mobile e-mail and rarely engage in telephone conversations; in public, many cover their mouths while speaking on their mobile. Restaurants and public transport authorities have erected signs urging mobile users to put their handset in "manner mode", or silent mode.

It is clear that we have not had sufficient time, as a society, to adapt to this new technology, with its overwhelmingly pervasive nature. However, patterns of behaviour are already becoming evident. The initiatives mentioned above represent a means to manage the potential embarrassment surrounding the public audibility of private conversations³⁴, or in other words "forced eavesdropping". It is an attempt to respect privacy (of oneself and others) in a public setting, or to create a private environment within a public one. An unanswered mobile phone is frowned upon, as are long intimate mobile conversations in public settings. Many who answer phone calls in meetings or quiet areas are subject to glances of admonition by others. The use of mobile phones is discouraged in most cinemas and theatres. New York city passed a law in 2003, fining people whose mobile phones ring in "places of public performance". A number of theatres and cinemas have taken the matter into their own hands, and set up mobile jammers. In November 2003, security officials in London were considering using jammers to block mobile phone signals around President Bush during his visit to London, in case terrorists might use a mobile to detonate a bomb³⁵. Jammers, though, are not only available to commercial enterprises or the police. Even individual mobile users can purchase cell phone jammers today, for as little as 300 USD (Box 3.1). The legal situation pertaining to these jammers varies greatly. In France, jammers in cinemas are common and not actively prohibited. In countries like China, Russia, and Israel, use is either permitted or enforcement is limited. In the United States, however, actively jamming a mobile phone signal is illegal, as it is seen to interfere with the right of service providers to exploit the spectrum they have purchased.

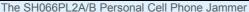
As the UMTS report "Social Shaping" concluded, "the intersection of the public and the private will reach a peak, after which there will be a resistance or backlash". ³⁶ We have already begun to witness its early signs.

Box 3.1: We're jamming –I want to jam it with you...

Jamming mobile signals is not only for businesses

Many websites offer personal and portable mobile phone jammers for the individual user who would like some peace and quiet during a meal at a restaurant. There is the SH066PL2A/B, for instance, which sells for 169.99 British pounds or 293 USD. This jammer will provide a mobile-free zone of about 30 feet and is disguised to look like a mobile phone. There are two models, A and B, the former for use in the United States and Canada, and the latter for Europe, the Middle East, Africa, and all other GSM countries.







The SRC 300 GSM Jammer

There are also less discreet devices which will cover a much larger radius, such as the GSM jammer SRC 300. These are typically used by businesses (e.g. restaurants, movie theatres) and law enforcement or security officers.

Source: MSN Slate, 5 December 2003; Global Gadget UK at http://www.globalgadgetuk.com/Cell Phone Jammers.html.

3.2 Individual responsibility and the illusion of communication

Not only has the use of mobiles in public settings been a common object of discussion and observation by sociologists and users alike, the possible adverse effect of mobiles on the quality of communication and on individual responsibility has also been noted.

Let us consider for instance the recent survey conducted in September 2003 by mobile phone giant Nokia. This survey found that a staggering 89 per cent of mobile users believe that people need to adopt better 'mobile etiquette', for example the use of such ringing and messaging tones as don't disturb others around them, and by not shouting and pacing while on the phone. In the United States, a similar survey by Harris Interactive in July 2003 found that 50 per cent of Americans believe that people are generally discourteous in their use mobile phones.

According to the results of the Nokia survey:

- 71 per cent of users are now consistently late for social events because of the option to rearrange through a mobile voice call or text;
- Almost 70 per cent admitted that they often cancel at the last minute by sending a text message; and
- 78 per cent admitted to ducking out of uncomfortable or awkward social situations by sending a text message rather than calling.

Indeed, many argue that mobile phones have served to change social etiquette. For example, people seem to be less committal. The "approxi-meeting" is now standard practice: mobile phone users rarely set an exact time and place for a meeting, the excuse being that details could always be worked out later by SMS. The habit of "keeping options open" or the "multi-meeting" has also been enhanced by the use of mobile phones, i.e. users often make several approximate and tentative appointments, deciding only at the last minute the meeting they would attend (depending on the value they ascribe to it). On the other hand, it can be postulated that mobile phones have given users more responsibility and have facilitated accountability, e.g. between children and parents or employees and employers.

Although the quantity of communication has increased through the anywhere and anytime functionality of the mobile, the qualitative aspect of communication may not have been correspondingly improved. Furtive text messaging, for instance, can often give an illusion of strong communication, whereas it is a medium which clearly lacks some of the principal elements of human interaction, e.g. tone of voice, body language, facial expression and touch. Some sociologists argue that texting teenagers run the risk of affecting their capacity to interact with each other on a voice or face-to-face basis: many choose to text rather than to talk, particularly in awkward or emotionally-charged situations.

It seems that despite the overwhelming availability of communications media (e-mail, fixed-line voice, mobile messaging, mobile voice etc.), people are becoming harder to reach. Users are aware of the fact that the mobile phone automatically records a missed call, and typically offers convenient voice mail services. Therefore, users are not concerned about missing calls accidentally, whether this be occasioned by the low volume of the ringing tone or by difficulty of physical access (e.g. at the bottom of a purse). A deliberate form of missing calls, the "call screen", is also becoming commonplace, given that mobiles typically display the number of the calling party. And, as mentioned above, many now prefer to use the written language to communicate rather than the richer medium of voice. It should be no surprise that the mobile phone, universally recognized as a great facilitator of human communication, is now showing that it is equally great in the obstruction of it. For the mobile is intimately related to language, which is known to reveal and at the same time to hide meaning and intent.

In another context, owning a mobile might seem to assuage an increasingly lonely urban existence. But is a virtual connection to anyone at anytime a real panacea to human isolation? The rise of spontaneous communication, for instance through trends such as multi-player location-based gaming and "bluejacking" (see Box 3.2) may provide an outlet for passing the time, but does not necessarily strengthen existing relationships. Moreover, the quality of face-to-face communications may be threatened by the always-on nature of mobile phones. Interaction with those that are co-present can be interrupted at any moment by interaction with a remote other – leading to a scenario of being always-on but never there.

It can, and has been, said that mobile phones tend to weaken *communities* (e.g. families or pre-determined static groups) while at the same time strengthening *networks* (i.e. decentralized and constantly evolving social groupings constructed by each individual).³⁸

Box 3.2: Blue me up, Jack!

Coming soon from a stranger near you

A new fad has sprung up among mobile phone users. Named "bluejacking", it involves sending short anonymous text messages to other mobile phones, not via SMS, but Bluetooth, a form of short-range radio technology. The technology works up to a range of 10 metres, and users with Bluetooth-enabled phones are able to search for other phones in their vicinity that are similarly enabled to accept messages. There are a number of websites (such as www.bluejackers.co.uk) that provide information about this form of mobile texting, including bluejacking etiquette and how to get a date through bluejacking.

A November 2003 article in the International Herald Tribune describes one encounter: "A lanky young woman with long brown hair was waiting to take a train at London's Waterloo Station, when she got a surprising message on her mobile phone from a complete stranger. "I like your pink stripy top". The woman, who looked around in confusion had just been "bluejacked" by a 13-year old British girl names Ellie who goes by the nickname jellyellie".

Bluejacking works by sending a contact from one mobile device to the other via Bluetooth. The bluejacker creates a new contact card and that contact card becomes the message. Bluejacking is free, and is an entirely unregulated form of communication. Though communicating in this way with strangers could get you a laugh or a date, it could also make life too easy for marketers looking for a way to send unsolicited messaging, raise a number of privacy concerns, and increase the possibilities for annoyance or even sexual harassment. But at the moment, the fad is a new one. And so far, it is being used for harmless spontaneous human communication, and not only by teenagers seeking a thrill.

Source: Bluejackers.co.uk, and various news sources, including "New mobile messaging craze spreads", BBC News, 4 November 2003, http://news.bbc.co.uk/1/hi/technology/3237755.stm and "A new way to say 'Hello it's me", International Herald Tribune, 17 November 2003, http://www.iht.com/articles/117854.html.

3.3 Love and dating with a mobile

On Valentine's Day in 2003, the major mobile networks were flooded with short text messages and virtual cards. But all year around, teenagers, and adults alike, are using SMS to flirt, make propositions to each other, or put an end to relationships. Many couples have reported that SMS plays a very important part of courtship, and in some cases, of the wedding (see Box 3.3). Operators are taking advantage of the texting craze by introducing a host of new mobile dating and flirting services.

Box 3.3: Will you mobile me?

If so, text me "I do"

A Belgian couple were married by SMS because text messaging had played such a big part in their relationship. The wedding took place on 14 November 2003 and the couple exchanged vows by SMS. Of course, the registry was signed in the traditional way to make sure the wedding was legal. The couple was quoted as saying the following with respect to their unusual marriage:

"SMS messages are very crucial to us, since I tour Europe six months a year with a bus full of American and Japanese tourists. While I'm on the road sometimes we send ten messages a day."

"Even the marriage proposal was done by SMS. One day while Ronny was touring in Italy I sent him the message: "Will you marry me?".

Source: Ananova, 30 October 2003, http://www.ananova.com/news/story/sm 833785.html?menu=news.technology.

Virgin Mobile offers a good example: in February 2003 the company published a 53-page guide (aptly named "The Joy of Text") for those users who were looking to increase their dose of "textual intercourse". For Valentine's Day, Virgin organized its first dating event or "SMS flirtfest", marrying the off-line and online worlds. Flirtfest attendees were given an ID number to wear that could be used by strangers who would like to get to know them. When a user would see someone they were interested in, they could send them an SMS using their ID number. The SMS are then displayed on large public screens for everyone's enjoyment³⁹. Some bars and pubs have taken to the idea, such as Dublin's "The Vaults", which ran a "text and flirt" game in 2003, allowing customers to register their mobile number with a central server and then exchange messages on big screens located around the bar⁴⁰. Not to be outdone, AT&T Wireless launched their matchmaking service, Match Mobile⁴¹, in February 2003. The service matches individuals based on postal codes, but also based on approximate geographical location at any given time. Mobile profiles allow real-time interaction and access to photographs of potential dates. Another example is UK's Mobiledateclub service, which provides the following instructions:

- For a heterosexual male, 27, named John: the user types DATEGIRL JOHN 27 in an SMS and sends it to number 82055.
- The phone recognizes where it is, e.g. in North London and will then search its database for all the registered heterosexual women in the area, by age range, and display their details and photos on John's phone.
- John can then scroll through a list of up to seven potential matches and send them a message, straight to their mobile phone. He can also pick up his own messages on his phone, or alternatively, by checking the website Dateclub.com. While browsing the website, the user can send additional messages to any other people. Both the website and the mobile keep track of dates and messages, so that John can receive replies on either.

Some services however, such as Bharat Matrimony in India, promise more than frivolous flirting, and offer their users the possibility to find a mate for life in just five minutes over their mobile phones (see Box 3.4).

Box 3.4: A Short Marriage Service helps couples find their mate

BharatMatrimony.com's SMS matrimonial service in India

Matchmaking via SMS has joined Internet matchmaking to give neighbourhood matchmakers and matchmaking organisations a run for their money. New York-based matrimony web portal BharatMatrimony.com has ventured into the area through its 'Matrimony on Mobile' service in India. The portal claims that anyone looking to get married can find a match for herself or himself in just five minutes via SMS!



Source: Yahoo News India, Bharat Matrimony.com.

Mobile phones have certainly made it easier to engage in spontaneous communications, perhaps facilitating that first step in finding a mate. They also help maintain a loving relationship, allowing couples to keep in touch when they are apart. However, the mobile has also contributed to heightened individualism, and some argue, to a reduced degree of intimacy between couples. When each partner has their own personal mobile phone, there is less potential for sharing communication experiences, or accidentally answering a call from a partner's friend, colleague or family member. In this respect, the mobile can also strengthen and even initiate romantic relationships outside a couple (see Box 3.5).

Box 3.5: That's Amore - a mobile affair...

The Italian daily "Corriere della Sera" warns readers to the dangers of taking their mobile on a holiday

Italians love to talk – it's no surprise that Italy is in the top 5 countries in the world in terms of mobile penetration. Although mobiles offer ways to enhance social networks and keep in touch with family, they also serve other less noble purposes. According to the Miriam Tomponzi detective agency, 87 per cent of cases of marital infidelity established by its detectives in Europe in the past year were revealed primarily through traces left on mobile telephones. In many cases, proof can be provided by a saved text message or call registers.

In July, the front page of the Corriere della Sera contained an article entitled "Telefonino and hidden loves". The paper warned readers of the added dangers of taking mobiles on holidays, as separation makes it very difficult to manage two or more parallel lives.

Interestingly, earlier in 2003, Italy's Vodafone Omnitel launched a service called "Alter Ego" for their mobile users: this service provides two numbers on the same SIM (subscriber identity module) card. Perhaps that could fool the detectives.

Source: The Economist, 11th September 2003, Print edition.

3.4 Mobile entertaining

Thus far, the most successful purely mobile entertainment service across the globe has been the ringing tone or "ringtone". Since the introduction of polyphonic tones, analysts predict that the sale of ringtones will outstrip the sale of singles. In March 2004, the Mobile Entertainment Forum (together with KPMG) even launched the United Kingdom's first "ringtone chart". Mobile music services are on the rise, particularly as more and more mobile devices come equipped with integrated MP3 players. A service in the UK by the name of "Shazam". anables users to get the details of a song (for instance, the name of the artist, the title of the song, the title of the album) and 30 seconds of the music. As the speed of transmission increases with future generation of networks, live audio and video streaming will become more commonplace, enabling a variety of entertainment, and educational services. Many predict that adult entertainment services will be a lucrative business for content providers.

Both single-player and multi-player gaming services are set to increase. With the added sophistication of location-based technology, users can engage other strangers around them in a game of Botfighters, for instance (see Box 3.6). Botfighters is an SMS game, but its principle is easily extended to multimedia platforms. Essentially, the application of mobility to entertainment services means that individuals can better

manage their time, by choosing when and how to be entertained. Mobile users can pass their time when standing in long queues or on long journeys.

One of the most important aspects regarding the growth of entertainment services over mobile phones, however, is that entertainment is not limited to the device itself. Mobile is becoming an important part of interactive mass media, making its presence felt on TV and radio programs such as "Pop Idol" and more recently on "Who wants to be a millionaire". TV games for SMS only are also growing in popularity around the world. Such games allow viewers to use mobile messaging to participate in games they can watch simultaneously on their television sets. Games can vary from trivia games, quizzes, crossword puzzles, and multiplayer games such as virtual bump cars. Other types of interactive media will become popular. Text-based soap operas, for instance, can be enhanced by multimedia handsets. Users will be able to watch live sports events on their handsets while placing gambling bets.

Having entertainment at one's fingertips means that managing content will become more and more necessary. Efficient content classification and parental controls need to be established, and preferably at an international level. Technical specifications and user awareness are pivotal to protect the rights of content providers. Social rules for mobile gaming, particularly location-based services, need to be developed. Opt-in and opt-out mechanisms and systems for safeguarding anonymity are important in this regard.

Some argue that the availability of mobile games anytime and anywhere may lead to a certain sedentary lifestyle among the young. The same argument has been raised with the Internet. Are we as a society more likely to read or view images of nature on our screens rather than by direct observation? Such a possibility is of course a boon to physically challenged individuals or as an educational tool. But how much is too much?

In countries such as Korea and Japan, the problem of game addiction is of concern, with some children playing games for 24 hours without a break. Entertainment at the touch of button may also lead to a certain passivity and loss of imagination. Some argue that the constant influx of data in this manner affects the human faculties of knowledge absorption and reflection, and eventually communication.

Multi-player games with strangers may give rise to an illusion among users that they are not alone and part of a community, whereas the reality might be that they are increasingly avoiding most forms of regular social contact. Games that involve taking care of virtual pets or friends may only serve to further isolate people, and particularly those users that have anti-social tendencies (see Box 3.7). With on-line virtual personalities and role-playing games gaining in popularity, one wonders just how far is too far - and whether this virtual path will lead human beings to increasingly disconnect from their real selves.

Box 3.6: Virtual SMS Assassins

Botfighters

Like many games, the aim of this SMS game is to "kill". A mobile user can target an opponent using positioning technology and SMS. When a user chooses his or her opponent, they can engage in a game with them through SMS "missiles". The player who kills the most people has reached the objective. Players rarely come face to face with their assassins but later versions of the game will most likely allow encounters. Each attack is charged as an SMS message and each "turn" of the game generates new messages.



Source: Guardian Unlimited "Ready, Aim, Text", 15 August 2002.

Box 3.7: Virtual domestic animals

Don't forget to walk your mobile after dinner

Domestic pets can be expensive and a problem when you need to travel. They can also create unpleasant odours. So, why not have a mobile pet? Virtual pet owners can decide when to take care of their pet, when to feed it and when to stop it from getting into fights.

Bandai's Tamapichi was the first mobile phone based virtual pet and was introduced in Japan in June 1997. Since then, a number of service providers have launched mobile phone pets and other interactive games. Bandai's "Tamagotchi" is an egg-shaped digital toy that simulates the life cycle of a pet. A digital representation of the home pet, it has been a great success with children due to its unique characteristics and ability to evolve.

MobilePet is another example of a pet that lives in a mobile phone, ready to play whenever the user would like to. Of course, the virtual pet owner must take care of the pet, by virtually feeding it and walking it regularly. Some of the games available use a handset's camera to create food. When the pet is hungry, users can snap a picture of a green apple, for example, in order to relieve its hunger pangs. Warning: neglect may cause virtual pet death.







Source: Java Games world, at http://java-games-world.com/index.htm.

4 Mobile and the workplace

This section describes how mobile technologies have transformed the worker and the workplace. It may be the year of the monkey in the Chinese calendar but if there was a technology calendar, this would certainly be the year of the mobile worker. Our society is rapidly transforming into one shaped by mobility, where human interaction itself is mobilised, thereby redefining our sense of time, space and context. With the advent of information and communication technologies (ICTs), our sense of time is no longer necessarily governed by linear clock time, but can instead be "socially negotiated" whenever needed. The traditional segregation of context disappears, in that private life can interrupt professional life and vice versa. For a long time, the workplace was a "safe heaven" of sorts, when the door was closed and the phone (if there was one) forwarded. But for the modern working nomad, the only place that might guarantee some disconnected time is on a train as it passes through a tunnel devoid of network coverage.

Mobile workers do have the important advantage, however, of roaming free, conquering the business world while on the go, aided by a briefcase (or pocket) of high-tech gadgets. Mobile and wireless technologies are a particular boon for the mobile worker, facilitating the exchange of information and enabling interaction with clients or colleagues, regardless of space or time. Indeed, much good has come of mobile communications. People are able to be in constant contact with one another - business is easier and life is easier. But what are the other implications of the increasing use of these technologies in the workplace?

4.1 Living to work

Some businesses, smaller ones in particular, take an integrated approach to work time and personal time. For many, this is part of the reason for setting up a small business: home demands (such as shopping or household tasks) can be fitted in flexibly with working life, and integration is regarded as a positive development. Many small businesses operate an integrated approach to work and home out of sheer necessity – they have to answer all enquiries that come their way in order to maximise their profits and in some cases make ends meet. Being available twenty-four hours a day and seven days a week (24/7) is part of the service they provide, and is used to improve reputation among customers.

The boundaries between work and home for corporate employees vary greatly depending on their profession, the work culture they are part of, and their own internalized philosophies about work and home. But generally, there is a greater possibility of separating work and home life if their occupation allows and their work culture permits.

All the same, mobile technologies are now placing added pressure to further integrate work and home. The increasing prevalence of business mobile phones makes workers potentially open to calls or text interruptions at all times. In addition, as the mobile phone number is for both professional and personal purposes, workers are usually unable to ignore work calls for fear of missing personal calls.

With mobile technologies, people are seen to increase their productivity, but at the expense of leisure time and family time. Because they can be connected at contacted at all times, workers have tended to increase their workload outside their office space and hours. Devices such as PDAs and mobiles have allowed people to check their e-mail and perform many of their work activities anywhere they may be. This is known in many circles as the "day extender" syndrome⁴⁷. While hours worked are increasing, many nomadic workers are not necessarily being paid extra for their work at home, and thus the "day extension" is at their own expense.

It can be said that we have lost sight of that glorious tradition of human thought, stretching back to the Greek philosopher Aristotle, which celebrated the importance of leisure time and reflection, and the ways in which they feed human capacity for work and wisdom.

In sum, the borders between work and home are becoming more flexible, but also more permeable. The phrase "work-life balance" is an ironic one today, when, for so many workers, particularly executives, life increasingly *is* work. Technology is eroding the boundary between work and private life. Not surprisingly, mobile technologies are fueling the activities of those who have trouble switching off. Such "workaholics" (see Box 4.1) might be defined as people who have a compulsive drive to define their identity predominantly through their work achievements; some may plausibly argue that "workaholism" is a means of avoiding intimacy with others.

Box 4.1: Should I stay or should I go?

For the mobile workaholic, the question is "should I turn it on or off?"

The opportunities for workaholics to displace other activities are increased by a number of social factors. The need to be available for colleagues in different time zones around the world; the increasing geographical proximity of work and social activities in urban areas; the rise of the high street coffee shop that is themed to look like a cosy living room, equipped with comfy sofas; the 'working lunch' of a desk sandwich; and the power of mobile technology are some of the trends that make it possible to completely blur the boundaries between work and non-work



There is a simple solution. One could turn off the mobile phone. And shut down the computer. Yet re-establishing our personal boundaries is not a simple, rational decision. Most people can think of at least half a dozen things that, were they to do them, would better their lives. We know that 'net junkies' (those addicted to the Internet or high-tech gaming) are more prone to depressive illness and loneliness due to the lack of face-to-face social involvement. So why can't we switch off? The risk stems from the feeling that being disconnected is tantamount to losing a connection to oneself, to one's sense of identity – an identity that is being increasingly defined in terms of a belonging to a network (see Chapter 3).

The peer pressure of being the last to leave the office has perhaps been replaced by the persecutory anxiety of keeping that mobile switched on 24 hours a day – just in case they need you.

Source: Adapted from "Office Hours: Should I stay or should I go?: Almost half of us no longer take our full annual holiday entitlement. Can we really be too much in love with our jobs to take a break?, Kate Hilpern, Jan 05, 2004.

4.2 Working on the move

Working on the move extends far beyond the home office, or of bringing the office home. Mobile technologies are transforming the way people manage their time, offering greater accessibility and flexibility⁴⁹. Using remote access or wireless LAN technologies, for instance, employees can reach their organization's network while on the go - from a hotel room, meeting site or clients' office. Workers need no longer fear missing a key e-mail from a client, colleague or family member. And the ability to remain in constant contact with someone via the phone can give workers an added sense of security.

Moreover, services ranging from simple mobile voice calls or text to 3G video conferencing provide employees with a means to contact their supervisors, colleagues or specialized experts, in order to get information and advice, and to legitimise any decisions they make through consensus and virtual on-site technical support. Such "just-in-time"-consultations can substitute traditional forms of supervision and instruction that usually rely on face-to-face meetings, instructional courses, and the on-site presence of experts or managers.

However, under these circumstances, centralized institutional control can be more difficult to maintain, because it is no longer achieved as a simple effect of physical walls or spatial distances. It has to be actively upheld by constant management procedures (e.g. by preventing employees from using PC's and mobile phones for private purposes).

Mobile phones have already encouraged and facilitated telecommuting. Still, many managers have a difficult time adapting to the supervision of employees without visual contact. Likewise, some employees have a tough time being away from the office because of feelings related to isolation or exclusion. Learning to address these issues requires significant cultural changes in the way managers and employees communicate, how managers evaluate and reward work, and the way companies define levels of empowerment and trust between managers and workers. The advantage of mobile phones, however, is that individuals are not limited to office space. The trend known as "hot desking" has taken off in Japan, for instance in the offices of operator NTT DoCoMo. Hot desking means that workers arriving at work in the morning pick a space to connect with their laptop computer (with wireless Internet connection) and mobile phone. This means that workers can be anywhere in the office building(s), including the cafeteria, while working, and that no worker has a fixed physical place in which to work. NTT DoCoMo has also added RFID (radio frequency ID) tags to some of the company mobile phones, so that the location of any given worker can be checked at any time at a specialized terminal.

A natural result of mobility is that enterprises can move towards a virtual and more efficient model, where people are distributed to meet the specific needs of the business. At their end, employees have the advantage of living where they choose, rather than where their employer is located. In this way, mobile technology simultaneously provides freedom and constraint. Mobile users enjoy a certain freedom from time and space (e.g. their desk), but they are also constrained in that they are never truly alone. Mobile workers relinquish control when they make themselves constantly available to others.

Also, what were once private places become public territory. And what were once public places (such as airport lounges, train stations and hotel lobbies) become private (professional and personal) through email, mobile text and voice interaction. Thus, tuning out one's professional life and maintaining a balance with personal life is becoming a greater challenge. Some managers and employees do not realize this. Because one is accessible "24/7", it does not follow in every case that one should be expected to be at work "24/7". Only because the technology exists, does not mean that it is productive to employ it constantly.

Workers can now take their office with them, or leave it behind. With mobile technologies, the choice might be theirs, if they are in a position to make it.

4.3 Mobile opportunity

Information and communication technologies play an important role in determining competitiveness, employment and economic growth. They create new opportunities that at the same time affect existing production, communication and distribution processes. In doing so, they hold the potential to change the spatial division of labour and production within, and across, countries, sectors, and enterprises. By increasing rapid access to both information and people, mobile technology in particular helps markets work more efficiently, by allowing consumers to seek the lowest price, and enabling firms to get quotes from more suppliers. It can also reduce transactional costs and barriers to entry. Farmers can, for instance, get instant information on weather, prices and crop conditions in order to be accurately informed of the value of their produce (see Box 4.2).

Box 4.2: Farmers use SMS for marketing their produce

Farmers can now monitor price changes in the market using the Short Messaging Service

Farmers in Kenya will no longer need to travel to central markets in order find out commodity prices – they can now find out directly through their mobile phone and SMS. This will most likely help minimise the exploitation of farmers by middlemen and commodity speculators.

The SMS service will be provided to subscribers of KenCell Communications, and was developed jointly by Kenya Agricultural Commodity Exchange (KACE) and Safaricom.

Farmers can currently inquire about prices of maize, beans, potatoes, tomatoes, cabbages and onions in the towns of Eldoret, Nairobi, Kitale, Bungoma and Karatina towns. KACE, an agricultural non-governmental organisation, plans to provide information on prices of approximately 100 commodities. They plan to extend the service to include alerts about disease outbreaks.

Source: Daily Nation on the Web, Peter Ng'Etich, 28 July 2003.

Mobile communications have been seen as important in opening up and facilitating business processes in both the developed and the developing world. And because wireless networks are faster and cheaper to deploy than the conventional wire-based communications infrastructure, their deployment can heighten the potential for economic growth in low-income countries in addition to unleashing their human and intellectual capital (see Box 4.3.).

Box 4.3: Fishing for Delicacies

Mobile phones facilitating and streamlining business processes in the Philippines

Pinoydelikasi.com was the first online store selling delicacies in the Philippines. It was established in 1999 to meet the demand for exotic foods and specialty items from Filipinos living outside main urban areas, and in expatriate communities around the world.

Fishermen supplying fish to the Filipino company are mostly located on Bantayan Island, where communication was limited to the village's single telephone operators. Therefore, to make an order, Pinoy was obliged to call the operator, request to speak to a particular fisherman and hang up while the operators tried to locate the fisherman. Pinoy offered the fishermen subsidized mobile telephones to expedite order placements.

A mobile success story – from an initial capitalization of less than 200 USD in 1999, Pinoydelikasi grew to 400'000 USD in three years, and has provided fishermen on Bantayan Island a regular income that is at least three times what they used to earn.



Source: International Trade Forum 2003.

4.4 Tracking the mobile

Albeit convenient, information technology in the workplace can make workers increasingly open to violations of their right to privacy. Many people are in agreement with the assumption that a certain amount of monitoring or tracking is necessary during working hours - the main reasons for such monitoring are set out in Box 4.4. However, privacy experts regularly warn employees that they may not realize how much they can be tracked during personal time, particularly if they use a company mobile phone or a GPS-equipped vehicle or device outside working hours. Increasingly sophisticated location-tracking technology is rapidly making its way into mobile phones, personal digital assistants, cars, trucks, boats, and perhaps even currency. For instance, many trucking companies already use location technologies (such as GPS) to keep

track of their fleets, estimate delivery times, locate stolen vehicles, and ensure that drivers don't violate regulations. However, can this information be used for non-professional purposes?

Box 4.4: Workplace monitoring

There are several reasons for the monitoring of employees. These may vary from one employer, and situation, to another:

- * To detect, investigate, and prevent crime, such as theft, fraud or illegal use of software or the intellectual property of the employer or a third party.
- * To prevent the unauthorized or unlawful disclosure of confidential business information, for example, trade secrets.
- * To comply with obligations to prevent discrimination or sexual harassment under applicable laws, and prevent or reduce company exposure to liability for the unlawful acts of employees, particularly in relation to racist or sexist communications in the workplace.
- * To maintain productivity and ensure the quality of products and services, and avoid damage to the company's reputation and goodwill.
- * To comply with laws and regulations, e.g., workplace safety, labour, tax and other requirements.
- * To ensure the integrity of information systems and compliance with company security and data protection policies.

Source: Quoted from International Chamber of Commerce, 2003.

A whole host of programs now allow employers to search for keywords in emails, read correspondence and view Internet sites visited by the employees. Some of this monitoring is justified. However, how far is too far? In the United States, before the enactment of the 2000 Regulation of Investigatory Powers Act (RIP), employers were generally careful to monitor emails only where they believed both the sender and the recipient were aware of the possibility that their correspondence was not private. The RIP, however, now allows employers to check the email of their employees without consent and for various purposes, such as recording evidence of business transactions, monitoring standards of training and service, and preventing unauthorized use of the computer system. The same applies to tapping telephone conversations – in fact, many employers routinely tap telephones, arguing that it helps to assess employee performance, ensure customer satisfaction and record evidence of business transactions. Similarly, an employee's mobile phone texts and calls can be monitored.

When legislation such as the RIP is coming out of a country that prides itself on individual freedoms, it might make us wonder whether "Big Brother" has won the fight before it even began. And in the current climate of international terrorism, access to the private data of individuals is unlikely to be restricted any time soon.

5 Mobile wellness and safety

One of the principal reasons cited for owning a mobile phone is added safety and security. Mobiles give users easy access to friends, family and emergency numbers. Carrying a handheld communication device means that users can easily contact roadside assistance providers, e.g. insurance companies and the police. Many parents are now giving their children mobile phones in order to ensure their safety, and health care institutions have begun exploiting the potential of wireless. Mobiles are also helping the justice system track down and convict criminals (see Box 5.1), thereby ensuring public safety and order. On the other hand, a number of scientific reviews have been conducted analysing the potential adverse health effects of mobile technologies. Also, as mobile communications and its content increases in use and scope, concerns about the protection of minors have been raised. This section explores the use of mobiles and their effect on the wellness of individuals, the public and the environment.

Box 5.1: Mobile phone records and the justice system

Mobiles as useful to police and courts as fingerprints and DNA?

In the highly publicized murder case in the United Kingdom of schoolgirls Holly Wells and Jessica Chapman, the police and the prosecution relied heavily on evidence stemming from mobile phone use, in order to convict the murderer Ian Huntley. Over the last five years, dozens of individuals have been convicted of murder in part due to evidence relating to their mobile phone or that of their victims. It has now become commonplace for detectives to conduct routine examinations of mobile phone records. Operators retain information about the cell visited by a mobile phone, when the phone was switched on and switched off, as well as call records for two years to five years.

However, there is a conflict between data protection legislation and the public interest in this regard. No consistent rules have been established for mobile operators to follow regarding the retention and release of personal mobile phone records.

Source: BBC News, 18 December 2003.

5.1 Mobile health applications and concerns

Over the past five to six years, a number of studies have been conducted on the effect of mobile phone technology (handsets and base stations, in particular) on human health. Thus far, no conclusive evidence has emerged. Some studies report no causal relationship between mobile phones and cancer whereas others have found mobile phone radiation to alter human cells, typically by encouraging cancer cells to grow. Mobile phones communicate via low-power radio signals between handsets and base stations or antenna sites. These radio signals are described as "non-ionising", meaning that they have insufficient energy to directly cause genetic damage⁵¹. It is to be noted that radiation is a neutral term, simply referring to the transfer of energy, e.g. heat radiation, light radiation, or radio frequency radiation. The maximum power that GSM mobile phones are permitted to transmit by present standards issued by the ICNIRP (International Commission on Non-Ionizing Radiation Protection⁵²) is 2 W and 1 W at 900 Hz and 1'800 Hz, respectively.

The GSM Association states that different brands and models of cardiac pacemakers exhibit a wide range of immunity levels to GSM and other types of radio signals.⁵³ For this reason, it has advised those people who wear cardiac pacemakers to seek the advice of a cardiologist before using a mobile phone. At least a 15 cm separation is suggested between the phone and the pacemaker. In Japan, public transport authorities have issued rules obliging passengers to switch off their mobile phone while standing near courtesy seats designated for handicapped people.

In January 2004, a report from the United Kingdom Advisory Group on Non-Ionising Radiation concluded that there was no evidence that mobile phones harm health.⁵⁴ Nonetheless, the scientists indicated that more research is needed before this can be said with certainty. The report is based on a review of all of the scientific research into mobile phone safety published over the past three years. Though it was stated that mobiles "appear to be safe", the report upheld the advice given by the Stewart Report of 2000 that children should limit their use of mobile phones to emergencies – hardly a guideline that is likely to be followed by young users.

Similarly, in the summer of 2002, the World Health Organization (WHO) issued a warning to parents to restrict mobile phone usage among children, due to the lack of knowledge about the risks.⁵⁵ The main

international statement from the WHO, "Electromagnetic Fields and Public Health: Mobile Phones and their Base Stations" dates back to June 2000 and states the following: "None of the recent reviews have concluded that exposure to the radio frequency (RF) fields from mobile phones or their base stations causes any adverse health consequence. However, there are gaps in knowledge that have been identified for further research to better assess health risks. It will take about 3-4 years for the required RF research to be completed, evaluated and to publish the final results of any health risks." Concrete results have yet to be published by the international body.

National and independent studies continue to be conducted. A 2003 Dutch study on the effect of 3G mobile signals found that radio signals of the next generation of mobile phone services cause headaches and nausea.⁵⁷ The study was conducted by three Dutch ministries (Economic Affairs, Health and Telecommunications), and was the first of its kind to test the impact of radiation from 2G base stations against those from 3G networks. The results will be shared with the European Commission. A 2002 Italian study found that leukaemia cells exposed to 900-megahertz radio waves for 24 hours were more likely to die than those that were not exposed.⁵⁸ On the other hand, a 2003 Australian study concluded that long-term mobile use has insignificant effect on human cells.⁵⁹ Still, scientists involved in the study warned that mobile phone users should still exercise caution.

Concerns over exploding mobiles at gas stations were raised in 2003, but later deemed as an "urban myth" However, in the second half of 2003, at least three cases of mobile explosions were reported, two in the Netherlands and one in Vietnam, and nowhere near petrol stations. Mobile manufacturer Nokia was forced to release a statement blaming faulty batteries (including illegal ones) for the exploding mobile phones. 61

Conclusive or not, the wealth of media attention, urban myths, studies and surveys devoted to the effect of mobiles on health highlights the fact that this continues to be a matter of concern. The paucity of scientific knowledge about mobile phone usage and the effects of radio signals only serve to exacerbate public fears.

Some concerns are more tangible, as for example, concerns over driving and mobiles. Many countries, such as Japan, Australia, and the United States, have introduced legislation governing the use of mobile phones by users while driving a motorized vehicle. In the United Kingdom, new legislation came into effect on 1 December 2003, which makes it an offence for a driver to hold and operate a mobile handset (even if it is fixed or in a cradle) for voice or data. The Department of Transport states that the use of any type of phone while driving is distracting, but does not require phones to be switched off.⁶² Hands-free equipment is not prohibited by the new regulation, but drivers are still liable for reckless driving.

As with other forms of IT, mobiles are being blamed for sedentary lifestyles. Together with computers and video games, mobile phones are being blamed for disrupting the sleeping patterns of a growing number of children, according to a Belgian study⁶³ conducted in 2003: the study found that one in five adolescents were awakened regularly by text messages late at night.

Meanwhile, hospitals and clinical laboratories have been taking to wireless technologies in order to improve their services to patients and promote health care. Mobiles have a great potential to help users in emergencies, and to help doctors provide services. An example is the use of picture messaging for effective diagnosis and patient care (see Box 5.2). As mentioned in section 2, mobile handsets can also be used as nutritional aids. Future innovations may even turn mobile phones into anti-smoking aids (see Box 5.3). Mobile operator mm0₂ and Oxford University in the United Kingdom are currently testing a mobile device aimed at improving the management of asthma: the device is combined with an "always-on" connection which can monitor breathing status and detect early signs of an asthmatic attack.⁶⁴

In Hong Kong, the national government used SMS to send a blanket text message to six million mobile phones in a bid to address spreading fears about the SARS epidemic.⁶⁵ A 14-year-old boy allegedly posted the hoax story on the Internet about Hong Kong being an "infected city", and the government's SMS read "Director of Health announced at 3 p.m. today there is no plan to declare Hong Kong as an infected area".

Box 5.2: MMS for hospitals

Camera-enabled mobile phones help doctors be more efficient

In a Welsh (United Kingdom) hospital, doctors are using the multimedia messaging service (MMS) or picture messaging to help them in carrying out their tasks. When a specialist is not available to make an instant diagnosis, general practitioners or junior doctors use the practical hand-held mobile phone to send picture messages of an X-ray. The use of mobiles has in this way reduced waiting times for orthopaedic patients. Previously, copies of X-rays had to be sent by telex or delivered by taxi to the specialists - an expensive and lengthy process. Staff at the hospital found the MMS trial successful: the technology provides a quick and cost-effective method of transmitting images between colleagues for discussion, advice and diagnosis. Images sent are not annotated and do not carry any of the patients' personal details.



Source: BBC News, 17 June 2003.

Box 5.3: Mobiles and nicotine

The mobile smoking patch?

Smokers who are desperate to give up their pack of cigarettes may soon be able to rely on a small program on their mobile phone or personal digital assistant.

The program would display a series of flickering dots on the screen, which psychologists claim could break some of the mental processes that fuel the need for nicotine. The flickering dots create what is known as "visual noise", which interferes with the pleasurable images that the mind associates with a given object of desire, such as the nicotine found in cigarettes.

The idea has been tested in a controlled study of students, using desktop computers. If successful, the program may prove an effective supplement to traditional chemical methods such as nicotine patches or gum.



Source: "Mobiles to beat nicotine craving", BBC News, 11 September 2003, http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/3101056.stm.

5.2 The environment and the mobile

The popularity of mobile phones has meant that there are millions of mobile handsets in circulation at any given time around the world. Users discard their old handsets and replace them with new ones, as new services and functions are introduced or as their old mobiles cease to work. In the UK, it is estimated that 15 million mobiles are replaced annually and the replacement cycle is usually about 18 months. Materials used in mobiles are often toxic and adversely affect the environment. Most people are aware neither of this nor of the recycling schemes for mobile phones. A UK survey found more than a quarter of people with new models said they would just put their old ones in the garbage.⁶⁶ In order to raise awareness, The Body Shop has in the UK has joined forces with a recycling firm, Greener Solutions, to encourage recycling for charity:

from 5 January 2004 on, mobile users are able to return old mobiles to the Body Shop for recycling or reconditioning, perhaps for reuse in developing countries. In Japan, operators have recycling programs, providing discounts for those who bring in their old mobile phones. Over 90 per cent of mobile phone parts are recyclable and Japanese operator NTT DoCoMo is working on increasing this proportion to 100 per cent.⁶⁷

Mobile devices and their components can also be used to encourage ecological awareness. Games and infotainment services such as Vodafone Live's conservation game can raise funds for charities (see Box 5.5). In India, SMS is being used to help save energy (see Box 5.6).

Box 5.5: Mobile Conservationism

Vodafone Live! introduces services to boost conservation efforts

Vodafone Live! has joined forces with Flora and Fauna International (a conservation charity) to provide a gorilla game and downloads of wildlife images, sounds and news. 100 per cent of all profits made from the games and downloads will be donated to conservation work.

The objective is to raise awareness of conservation through mobile phones, and create a community of interest. The java game is developed by the games company Masabi, and incorporates game play as well as accurate facts about gorilla habits and habitat.

Source: BBC News, 2003.

Box 5.6: Text to Light

Indians save energy through SMS

For the reduction of energy waste and mounting electricity bills, the Kalamassery municipality India is planning to install 'smart street-lights'. This will allow the municipality to operate street lights through SMS messages sent from a mobile handset. An SMS sent to special sensors installed in the street lights will check the status of the lights, and send back a message with information on whether the lights have been turned on or are switched off. Another cost-saving feature will make it possible to dim street lights after 11 p.m. when streets are deserted and do not require maximum illumination.

Source: New India Press, 19 May 2003, http://www.newindpress.com/Newsitems.asp?ID=IER20030518130157.

5.3 Mobility and emergency services

It is no surprise that mobile phones can be extremely useful for emergency services. With the proliferation of mobile devices, there is an increased chance that somebody witnessing an emergency (e.g. car accident, fire) or a crime has a phone and can contact the pertinent authorities. This ensures that services are deployed rapidly, and, as many callers typically phone in an emergency, more details can be ascertained and hoaxes revealed. In May 2003, as part of the Wireless Safety Week, the US body CTIA reminded American users to use text messaging as an effective means to contact emergency services⁶⁸.

SMS has in fact been used in a number of cases to report an emergency. There was the case of the two British climbers who were stranded in a blizzard for three days in the Swiss mountains. They were saved after sending a text message to their friend in London asking for help and providing details of their whereabouts.⁶⁹ A number of mobile-assisted public emergency services are popping up. In 2002, the United Kingdom Environment Agency and Metropolitan Office, as well as the Malaysian Ministry of Agriculture, began providing flood alerts by SMS.⁷⁰ An emergency SMS service for the deaf community has also been set up in the Midlands region of England (see Box 5.7).

The growing use of mobile phones does increase the importance of a user's "civic duty", i.e. duty to contact emergency services and provide adequate information.⁷¹ Given that emergency numbers vary from country

to country, mobile manufacturers (for instance in Japan) are including "one-touch" emergency service buttons on handsets.

Box 5.7: Texting in an emergency for the hearing impaired

The UK Midlands Police launches an SMS emergency service

A survey carried out by the Birmingham Institute of the Deaf (BID) found that 98% of hearing impaired people use SMS, and 85 per cent would like to use text messaging to contact the police.

Earlier methods of contacting the police in an emergency were clearly not suitable for the deaf, hearing-impaired or the speech-impaired. Most police forces offer a system for the home to contact the police, but the SMS system addresses those instances where the person is away from home and witnesses a crime or serious road traffic collision and needs to contact the police urgently.

Source: Net Imperative, 11 July 2002.

One of the most important advantages of the mobile phone is the availability of location information for the purposes of emergency response. Even without sophisticated location technologies, mobile operators can already pinpoint the location of a mobile phone transmission to the nearest cell in which that phone is being used, or within 500 meters. Simple triangulation techniques can further pinpoint a user's location within 150 metres. New 3G mobile phone networks are meant to determine the location of mobile within ten metres.

Governments and regulators, such as the Federal Communications Commission (United States) and the European Commission are implementing initiatives to facilitate the response to emergencies through mobile phones: the E112 initiative in Europe and the E911 in the United States require mobile operators to be able to inform emergency services of the location of a caller in an emergency⁷². The two initiatives, however, vary greatly. In the United States, the FCC has given mobile operators until 31 December 2005 to be able to pinpoint at least 67 percent of callers to within 50 to 100 metres, and certain milestones need to be met before that time⁷³. The rules are more lenient on the other side of the Atlantic. The European Commission's Coordination Group for Access to Location Information by Emergency Services (CGALIES)⁷⁴ has issued recommendations to member states that mobile operators be capable of providing location information, but has not set any specific performance standards. In 2005, the Commission will review the progress made and decide whether or not to issue further guidelines. Despite regulation in this area, sophisticated location technology does not ensure fast response times. This is due to the role of the PSAP or "Public Safety Answering Point", which is the point that receives the emergency calls. Though equipped to read the location and number of a fixed-line caller, most PSAPs do not have the requisite technology at this time to fully exploit location information sent by mobile operators.

Nonetheless, carrying a mobile phone has given users the world over an added sense of security, and has proved to be a lifeline in a number of emergency cases.

5.4 Protecting mobile minors

The main reason that a parent buys a mobile phone for a child is to ensure their safety, particularly outside school hours when they are not supervised. With a mobile, children can easily telephone their parents when they need a ride or are in trouble. With location-based services, parents can further track the movements of children. It is already a few years since, Japan's NTT DoCoMo introduced a child-tracking service, called "*ima-doko*".⁷⁵ Similarly, a location technology based on SMS is helping British parents know their child's whereabouts (see Box 5.8).

Although concerns of the popularity of SMS and its effect on literacy have been raised, mobile technologies are also being used in the educational system, with countries such as Malta, providing test results via SMS⁷⁶.. In Ireland, SMS is being used to decrease the amount of absenteeism in schools: when students miss the morning attendance call, a text message is automatically sent to their parents to ensure that their absence is legitimate⁷⁷. With developments in handset technology, such as the videophone, the delivery of educational services will be further enhanced.

Though the mobile is an effective method of protecting and delivering valuable information to young people, its widespread use also raises some concerns. The main concerns are as follows: bullying, health issues, content standards and exploitation.

Bullying at school has spread to the mobile phone, and in particular by SMS. SMS bullying is rapidly becoming more popular than the calling of names in the schoolyard or the passing of notes. It is a serious concern and some countries, like the United Kingdom, have officially taken measures to put an end to such behaviour. A 2002 NCH (National Children's Home Charity) survey revealed that one in four British children have been bullied by text messaging. One possible solution, proposed by a company called Sicap, is a service that blocks SMS from designated numbers. However, this will not block anonymous SMS sent over the Internet⁷⁸. The bullying can extend to death threats and have tragic consequences, such as suicide.

Box 5.8: Child location via SMS

ChildLocate.co.uk launches service to track children

A new web and mobile phone service called ChildLocate.co.uk has been launched to help parents keep an eye on kids from a distance. The subscription-based service, which claims to be the first of its kind in the UK, allows parents to monitor the whereabouts of their children without needing to constantly pester them with phone calls. Parents can access information via the childlocate website and the system uses SMS signals to determine the child's location.

Source: Childlocate.co.uk.

As discussed above, there is insufficient knowledge of the health implications of mobile phones, and particularly on children. Apart from the effect of radio signals, the zeal and frequency with which young children text each other, has led to some unusual cases of "textitis". Many doctors are warning that mobile users, especially children, can be prone to painful swelling and inflammation of the fingers and thumbs (named "SMS thumb") from sending too many text messages⁷⁹ - a new form of RSI or repetitive strain injury. The sleep patterns of children may also be disturbed by the exchange of text messages late at night.

Still, mobile and texting continues to grow in popularity among teenagers. This means that an increasing number of young people can lead lives and interact with groups that are unknown to their parents. One of the problems with this scenario is that, like Internet chat rooms, it can facilitate the exploitation of children. In Japan, for instance, the mobile has encouraged the popularity of underage dating and the phenomenon of the "paid date", or *enjo kosai*. A number of mobile dating sites have popped up in Japan, such as "Star Beach", a highly lucrative business that provides websites for the posting of personal advertisements, which in some cases can eventually lead to situations in which children date adults, typically for money. The Japanese Police Authority is currently looking into ways of reducing the number of paid dates initiated by mobile phones. However, it seems there is insufficient information about these sites, and some teenage magazines even encourage children to meet people through these dating sites. In other countries, authorities are looking into ways to protect children from inappropriate content available to them over increasingly sophisticated multimedia-enabled handsets (see Box 5.9).

Box 5.9: Protecting children from harmful content over mobile phones

UK operators band together to prevent children's access to pornography

In January 2004, six of UK's mobile operators have signed a Code of Practice, agreeing to abide by a scheme to protect minors from pornographic sites. The scheme classifies mobile websites, and those which are rated "18" and above can be barred by adults purchasing mobile phones for their children.

Content with an "18" classification will only be available when network operators verify the age of the user. As access to chat rooms is also of concern, the code will ban those under 18 from mobile chatrooms which are not moderated.

Source: BBC News, 19 January 2004.

6 Conclusion

No technological development is possible without effect upon society. Witness the changes brought about by gunpowder, electricity, the radio and the fixed telephone in their turns. Today, it is nuclear power, rockets, the Internet and the mobile phone that are in the forefront. Of tomorrow, we know not.

Clearly, no one will deny the evolving nexus between technological innovation and the human condition. Never before have technical devices played such an important role in our daily lives. The development of mobile technologies has been pivotal in this transformation. Among teenage girls in Tokyo, the penetration of mobile phones has reached nearly 100 per cent. In a growing number of instances, wireless networks have succeeded in connecting isolated and less developed regions of the world. In 2002, the number of mobile phones worldwide outnumbered the number of fixed line phones. Moreover, electronic messaging (i.e. email and SMS) has become the medium of choice for business and personal communications. And through rapid innovation in wireless connectivity and portable Internet access, technology is becoming increasingly personalized. Indeed, its ubiquity is no less a social phenomenon than it is a technical one.

Of course, with the spread of "anywhere, anytime" communication infrastructure, comes increased convenience, better access to information and streamlined business processes. The capacity of current and future technologies to enter the private sphere of human lives, however, is correspondingly increased. Already, most mobile operators can pinpoint the location of their customers to an accuracy of 100 metres. Unique radio identifiers, such as RFID, embedded in clothing and other items for purchase, can determine the whereabouts and habits of consumers. Mobile phones equipped with camouflaged digital cameras can instantly upload private images onto the public Internet. And the amount of such "person-generated" content available on public networks will only increase with time, as evidenced by the popularity of peer-to-peer networking. At their end, developers are considering ways in which to facilitate machine-to-machine communications and foster convergence across networks, platforms and services. The extent to which humans and machines will be connected to each other, constantly transmitting vitals, data and private information, can at this time, be only imagined.

Some fifty years ago, the great Indian leader, Mahatma Gandhi was assassinated. His last and only possessions are on permanent display in an Indian museum. They consist of his loincloth, pocket watch, sandals and walking stick. In today's world, one doubts not that a mobile phone would have replaced that pocket watch: so indispensable to daily life has it become. But the inconveniences arising from the presence and use of mobile phones are gradually becoming apparent. The growth in their volume and use are accompanied by multiplying instances of their unwanted effects. In this respect, the mobile follows the pattern of any technology when it is first introduced. The motorcar offers a clear example: it took some fifty years after its introduction to make its inconveniences abundantly clear. By contrast, the mobile phone has taken less than a decade. So useful has the mobile phone proved to be, that many of its annoyances are taken in the stride and little rational regulation has thus far occurred. For early users of the motorcar, there was little need to introduce pollution and traffic controls, or create conventions such as shoulder checking, but these became vital as numbers grew. Similarly, growing experience with the use of mobile phones will iron out many of the glitches now current. However, like in the case of driving a car, it is important to ensure that correct habits are formed early.

Moreover, it is in these early days of innovative energy that society, as a whole, has the rare opportunity to consider the implications of these new technologies. Serious thought needs to be given to the design and implementation of fair policy and regulation in the public interest, to ensure healthy market development, and to thwart disinformation and misuse. Mechanisms and safeguards to be developed by policy-makers should no longer be sector-specific as traditional telecommunication regulation has been in the past. Public policy for the protection of consumers should be wide in scope and include service pricing, prevention of abusive and harmful content (including SPAM and adult content), health and environmental considerations, surveillance and privacy issues.

This paper has described the extent to which the mobile phone has entered daily human existence, how many of its effects have been beneficial, and how there is much to be wary of. Indeed, as in any new development, it is at or immediately subsequent to its introduction, that suitable steps can be taken to ensure its proper establishment.

Endnotes

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