

Informing Suppliers about User Behaviours to better prepare them for their 3G/UMTS Customers

Final Report: Assessment and Analysis of Findings

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UMTS Forum overview of study and its outcomes.

This Study set out to inform suppliers about user behaviours so that they can be better prepared for the expectations of their 3G customers. In advance of the mass-market availability of 3G products and services, the study was not able to explore in depth the actual user adoption of 3G as a technology, but instead it looked at the whole repertoire of mobile mediated communications that will provide the context for 3G.

It consulted over eighty people from Western Europe and, in addition to confirming others' research, it has also identified some new ways of doing things that will influence the take up of 3G/UMTS products and services. In particular it found that new products and services are expected and tried out willingly by some consumers as part of their annual upgrade, for example camera phones. These 'user explorers' are of any age and may be business or personal users. Willingness to adopt new ideas is, however, tempered by the reluctance to discard old ways of doing things, (often as backup), especially in businesses where a variety of ICT is in use simultaneously or piecemeal.

The omnipresence, globally, of mobile communications has enabled its users to find new ways of using their repertoire of mobile mediated devices. They are less troubled by how it works or whether they can understand how to use it. Instead they are developing strategies for making the most of bundled packages and negotiating shared access of all types of ICT within their household and business groups.

This willingness to embrace the new whilst finding ways of keeping hold of past practices is fundamental to the adoption of 3G which is likely to be seen as an adjunct rather than a replacement of existing products until its capabilities can be explored and incorporated into everyday life.

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1. Executive Summary

It was clear from the first study conducted for the UMTS Forum ‘Social Shaping of UMTS’¹ that there was more to be learned about how the social shaping of technology by its users might manifest itself once new ‘3G’ products and services, using image in particular, became available. How would people respond to these new and more diverse mobile communications products? In order to inform and assist suppliers to better prepare for future 3G/UMTS customers this Study has investigated three social shaping themes that have been developed from the outcome of the first study. In addition to building on the first report this study has made use of newly gathered material from the examination of recently published academic literature, new empirical research especially commissioned for the study and workshops for consultation with industry and academic experts.

The UMTS Forum specifically requested the study investigate users of 3G/UMTS type services (image and mobile internet) and also requested that the researchers should avoid looking at early adopters within the mobile communications industry as it was considered they may be a biased sample. The adoption of 3G/UMTS services has, however, been slower than anticipated during 2003 and thus neither the devices nor their applications have a significant presence in any of the societies examined. This has meant that the study had to find new ways of achieving its aims. It has done so by collecting the material in a variety of ways including diaries, questionnaires, shadowing and observation.

This research project has been undertaken in three parts.

Part 1 of the study comprised a review of new literature and academic discourse that built on the social shaping themes developed in the aforementioned study conducted for the UMTS Forum in 2002/03.

These themes were

Social Connectivity – mobile devices do not enable more social relations but more intensive relations with already existing social contacts

Emotion and mobile phones

Users have a more emotional relationship with their mobile phones than they do with other forms of computational device.

Public and Private Behaviours

The intersection of public by private behaviours enabled by mobile phones will reach a threshold beyond which resistance will start to occur.

The outcome of Part 1 was the refinement of the three social shaping themes and these were used to investigate the social practices of three

¹ Vincent, J., Harper, R., ‘Social Shaping of UMTS’ (2003) UMTS Forum Report 26

groups of mobile communications users. The three investigative themes used in Part 2 of the study were:

Keeping Connected: people are intensifying their social relations through their use of mobile phones

Mobiles are changing people's behaviours: people are so dependent on their mobile phones in particular that it is changing their behaviours and affecting them in their day-to-day lives

Behavioural Convergence: people are mixing and matching multiple ICT in a personal way such that they have converged the use of devices – fixed and mobile – to suit their own unique lifestyle and ways of doing things.

Since the first study much more research has been published and shared with the authors and thus Part 2 of the study, the empirical phase, was able to use this new material to identify and target three groups of users with particular relevance to 3G/UMTS. The qualitative approach used in this study has meant that these groups were explored in much greater depth than if a larger scale quantitative survey had been used.

The three groups of users examined in this way were three generations of families, business teams and 'technology explorers'. All the subjects were based in the south of England in the UK.

Following the examination of these groups of users using the three investigative themes five key implications for suppliers have been developed.

1. Communications strategies are being developed by users to leverage maximum cost benefit for them

Although people do appear to be using mobile mediated communications more the evidence suggests that they are doing so by maximising the bundled packages and upgrades that are offered to them by their services providers. This financial management of mobile communications is shaping the adoption of new services and of mobile phones in particular. Potential 3G/UMTS customers are unlikely to be interested in new services unless they are presented to them as an upgrade or 'better deal' than they already have, or else if they can obtain these services from another provider.

2. The increasingly complex use of multiple modes of communications in families and how this is negotiated influences their adoption and use of services.

Families are accustomed to sharing their ICT and although they may each have a personal mobile phone this practice of sharing can even extend to that device. The use of mobile communications is interleaved with their fixed line communications and either may be used, as well as text and voice, to ensure contact is achieved whenever needed. Supplier recognition of the behaviour of the family group of users may better inform the design of products and services so that they more closely meet their needs.

3. *User Explorers have a major role to play in the adoption and continued use of 3G/UMTS products and services.*

User explorers are interested in what the product can do for them more than in how it works – indeed the mystery of how it happens is, for some, part of the excitement. They expect to be able to push and play until they achieve their goal but expect a simple interface that enables this with minimum key pushes. Being able to feel that they have mastered the new capabilities on their own would appear to be key to their satisfaction with the new product. The industry should continue to monitor what types of uses and practices these people develop.

4. *The historical role of image in everyday lives appears to be shaping the adoption of picture and video messaging.*

People already know about cameras and so apply this knowledge to using camera phones. In so doing they are discovering they can integrate with other ICT such as blue tooth and home computers and may even use the camera phone as a substitute for a conventional camera in some instances. There is still some uncertainty about its usefulness though people are still experimenting to find out what it might do for them. Further, there is no etiquette yet for taking pictures with a camera phone; already there is resistance and introduction of regulation in various countries to mitigate the misuse of the pictures taken.

5. *The position of present day mobile communications within numerous layers of ICT in the workplace is influenced by personal preference and social needs*

As with families mobile communications in business are interleaved with a variety of other ICT – fixed and mobile. Business people tend to use the type of device and technology that best suits them and, so long as their employer maintains the range of capabilities that they prefer, they will continue to do so. It is notable that they are not simply giving up their old technological practices for the new ones, the situation is much more complicated. The mobile phone, although relied upon by others to make contact in an emergency or to phone ahead to make new arrangements due to delays, is quite often only used to maintain social contact with family friends and business colleagues.

2. The 3G/UMTS mobile communications environment

This study has made two key assumptions in considering the context in which the supplier is preparing for the 3G/UMTS Customer. Firstly it asserts that 3G/UMTS is not simply about this particular technology and its associated mobile devices but it is about the whole repertoire of communications that are mediated via these. Secondly it considers the future uses of these products and services from the perspective of the social practice of groups of users and how they are developing new ways of doing things.

In adopting this approach it has been possible to examine and explore areas beyond the domain of the present day mobile phone and which are thus applicable to the future users of 3G/UMTS products and services.

The challenge to the supplier of 3G/UMTS is to recognise which of the social practices identified in this study might be applicable to the successful adoption of their products and services and in so doing successfully penetrate this complex mobile communications repertoire.

The Mediated Communications Repertoire

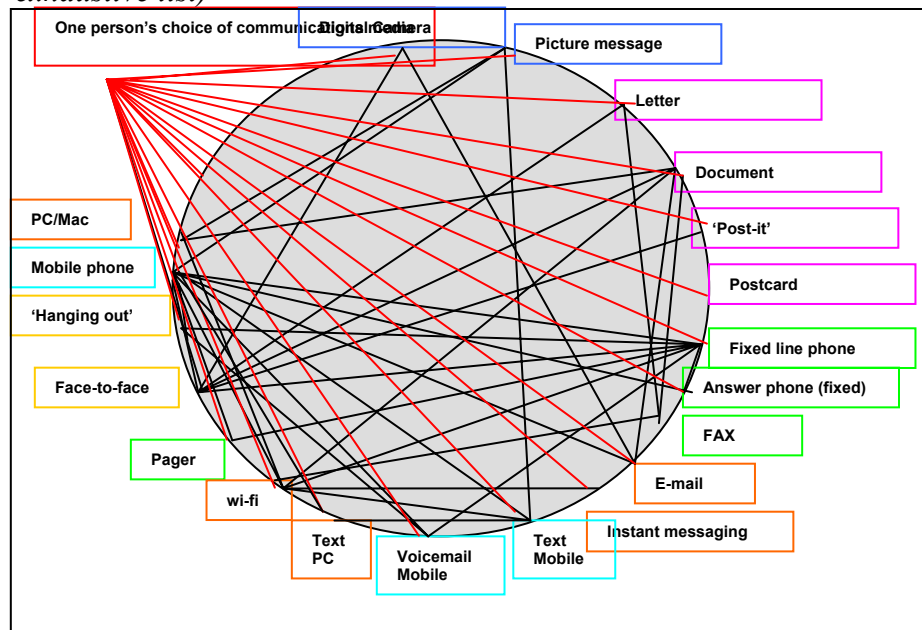
The repertoire of mediated communications available today comprises many devices and methods of communicating including mobile and fixed phones, personal computers (PCs and laptops) and wireless local area networks (wi-fi). It includes face-to-face conversation, paper transactions and the use of image, music and games. This list of mediated communication is not exhaustive and is further leveraged by whether it is a voice or alphanumeric transaction, talk or text, email or letter, conducted in real time or in asynchronous steps and so on.

This range of choices, shown in Figure 1 below, highlight that even mobile communications involve more than merely speaking or texting on a mobile phone.

The person initiating the communication must decide what type of media is appropriate for them to use and ask whether it will be the same for the person they are contacting? They may consider what that person prefers, whether a text is appropriate or should it be face to face or in a letter? If a reply is demanded then the reciprocal arguments apply.

It is this vast repertoire of communications choices available to each potential 3G/UMTS customer that lies at the heart of preparing them for new products and services, but just where does 3G/UMTS fit?

Figure 1: The repertoire of mediated mobile communications (not an exhaustive list)



Continuity of Social Practices

In conducting this research the study has identified a complex mix of social practices associated with this repertoire – in other words a variety ways of doing things associated with communications. The key to unlocking the link between these practices and how to prepare for 3G/UMTS is to view it from the perspective of maintaining the continuity of present day social practices. Indeed there are some aspects of everyday life in society that have remained constant throughout social and technological change. These include the comfort of feeling safe, of being near to loved ones and of shared moments. It is also about being able to solve problems and to transact business and for some it also about being associated with the latest ‘thing’.

What this study shows is that people are constantly embracing new technologies and new ways of doing things but they do so to satisfy their needs and they often do this in ways that are familiar to them. Indeed what has been discovered is that contrary to the expectations of industry the early adopters of 3G/UMTS type services are more likely to be ‘User Explorers’ - people who are interested in the product for what it can do for them and how it meets their needs. This is in contrast to the early adopters of other new technologies such as wireless computing, or indeed mobile data, who will buy the product for the technology and what it could do, almost regardless of whether it was of use to them or not. To exemplify this consider why people are buying camera phones and also what they actually have a mobile phone for?

Are camera phones just the latest way to do the same old thing?

Some people are viewing the camera phone as simply a modern means of taking the holiday snap or to record a special family moment that in turn replaced the posed family portrait taken on seaside holidays at the beginning of the 20th Century. People have wanted to capture and share moments in their personal history with each other since time immemorial and have used any technology or capability available to them to achieve this. Perhaps the camera phone is simply another means of satisfying this need.

Just what are mobile phones for?

The mobile phone can also be viewed in a similar way to the capturing of images outlined above. Although a relatively new capability it is primarily used to maintain contact between family and friends to achieve the comfort of being near each other and to manage arrangements. It does this successfully by being able to connect with many other types of mediated communication and is thus integrated within this increasing range of communications capabilities. The mobile phone does not merely serve as a substitute for other past or present communications media. It has a unique place in many people's lives as the focal point for all their communications enabling a sense of constant presence amongst a group of friends, family or business colleagues wherever they may actually be located.

3. Identifying the User Behaviours that will enable suppliers to be better informed

Introduction

This study began with the premise that three social shaping themes developed in the first study conducted for the UMTS Forum in 2002/03² were of particular relevance to the launch of 3G/UMTS. These themes were: **Social Connectivity** – mobile devices do not enable more social relations but more intensive relations with already existing social contacts; **Emotion and mobile phones** - Users have a more emotional relationship with their mobile phones than they do with other forms of computational device, and finally **Public and Private Behaviours** - The intersection of public by private behaviours enabled by mobile phones will reach a threshold beyond which resistance will start to occur.

This study has also surmised that by developing a better understanding of the user behaviours (or social practices) associated with the further development of these themes that the suppliers of 3G/UMTS could better prepare for their future customers.

Development of Investigative Themes

This study commenced with a review of new literature and academic discourse that built on the social shaping themes from the first study.

The literature and academic review found new research that had been published or was being reported during 2003 and this was used to augment the social shaping themes and to create a series of explanatory hypotheses. These are listed in table 1 at the end of this section of the report. Further synthesis of the material gathered through desk research, participation in international conferences and workshops and interviews with leading academics resulted in the creation of the three investigative themes that have been used as the basis for the assessment of the material gathered in Part 2 the empirical study and for reporting the findings in this final part.

The three investigative themes summarised below are discussed in more detail in the next section of the Report.

1. **Keeping Connected** - the hypothesis is that people are intensifying their social relations through their use of mobile phones.

² Vincent *ibid*

2. **Mobiles are changing People** – the hypothesis here is that people are so dependent on their mobile phones in particular that it is changing their behaviours and affecting them in their day to day lives

3. **Behavioural Convergence** – the hypothesis that people are mixing and matching multiple ICT in a personal way such that they have converged the use of devices – fixed and mobile – to suit their own unique lifestyle and ways of doing things.

Analytical Approach

Investigation of recent studies revealed that qualitative research has tended to emphasise the role of the individual and their social and business networks in its findings. In contrast the empirical research especially commissioned for this study was conducted from the perspective of groups of users. By exploring more than one member of the same group of users on the same day the researchers were able to learn more about the reasons behind the communications within the group. Gaining insights into the behaviour of a group of users in this way has particular relevance for provision of services, particularly those relating to location and time of day usage, and this qualitative approach should help inform the preparation of future quantitative studies by suppliers of service to these groups.

By drawing on prior research to inform the study the empirical research was able to focus on a smaller selection of subjects on a much more detailed level. The study used a variety of methods to collect the data all of which aimed to gather material about mediated communication. One method in particular, the use of diaries and interviews with the family groups, provided particularly rich data. Data was also collected about business teams and technology explorers by shadowing the subjects and interviewing them. A more detailed list of the empirical sources is contained in Appendix 3.

The Groups of Users

Three groups of users were explored and examined in Part 2 of the study. These groups were Three Generations of the same Family, Business Teams and Technology Explorers. In order to find suitable subjects for research a brief was prepared describing what these groups might typically comprise.

Looking first at the **Three Generation Families.**

The Expected Scenario

This group was expected to comprise of three generations of a family each of whom own a mobile communications device and are users of other computational devices in a variety of ways. Their primary motive for being connected as a group is peace of mind and managing their

time. Individual motives are independence, emotional attachment and personal security together with connectivity with their own social groups.

The Actual Case Studies

Whilst this was found to be partly true in fact the study found some interesting differences. For example it found some reasons why mobile communications has increased and some motivations for this; it confirmed the interest in mobile communications on the part of children and the spread of this technology to the elderly. However, although the children may be interested they are also constrained from using the mobile. The older people may use their mobile phone but they use it in more limited ways than younger adults restricting it more to utilitarian use.

The second group were the **Business Teams**.

The Expected Scenario

These were expected to be men and women who form a project team but who are not necessarily from the same company. They are all users of mobile communications but some are more technologically literate than others. They are motivated to use mobile communications by business need as well for social connectivity and their use overlaps into the family scenario too. Every member of the team has a mobile phone with compatible MMS, a lap top with wi-fi, they each have some form of PDA – e.g. Palm or Blackberry, and they have a LAN connection at their shared office where there are fixed phones for conference use. They are completely dependent on their mobile phone and cannot imagine life without it – they would not be able to do their jobs or compete in their business market without mobile communications.

The Actual Case Studies

In fact the Business Teams were found to have little or no use for the more advanced mobile communications products and services, and in particular the 3G type services with picture or video messaging and mobile Internet services. Indeed employees were found who had spurned the mobile phone refusing to have one at all. This is not to say that the businesses were filled with anti-technologists or anti-mobile phone users, on the contrary they had almost every type of workplace ICT and used them piecemeal according to need and to some extent their enthusiasm for the product.

The third group were referred to as **Technology Explorers**.

The Expected Scenario

These are the people who are interested in the technology itself, use it to achieve their aims and to help develop their social lives. They comprise a disparate group connected by the mobile internet but not necessarily known personally to each other. They are avid users of technology but seek to extend the limits of its capability ‘because it is there’. The motivation for their mobile communications use is the social connectivity and emotional attachment to content. Their needs are

social interaction with like-minded individuals with whom they can compete to test the limits of the technology and play computer games.

The Actual Case Studies

They were expected to be the early adopters of 3G type services but this is not necessarily so; devices such as the Nokia Communicator are still considered to be technologically advanced in their capabilities and thus remain appropriate today. Technology explorers were found to be critical enthusiasts, reluctant to replace an existing device with something that had not yet been proven to be better than the one they already owned. Most importantly the research found that this group is better termed 'The Explorers' and that it is the less technologically aware or interested user explorers who might have the most influence on the success of 3G/UMTS. Today's 'User Explorers' are much less tolerant than their technology counterparts and will only push and play so many times before they despair with the product and discard it; such as with the 14 or so button presses it takes to send a picture message. In addition user explorer needs may be driven by fashion rather more than by a continuing need and thus product capabilities may fall prey to passing trends – witness the decline in picture messaging in Japan despite the now virtual omnipresence of the capability in an image rich society.

The actual case studies are contained in Appendix 1.

Supporting Data

In addition to researching the groups of users further data was obtained that provided additional material to both assess and complement the study. By extending the data gathering in this way the research team was able to assess and confirm the credibility of the results of the empirical research.

Observation in everyday life

The Researchers carried out observational studies in various locations in the UK, Finland and Belgium. These were to build a portfolio of vignettes showing users of mobile communications in public and private situations when at work, leisure, shopping, waiting and travelling.

People of all ages - from babies to the very elderly were observed using, or being assisted to use, mobile phones. Camera phones were seen being shared and displayed or just being used to talk. People, it was noted, checked their mobile phones for messages and talked or texted while walking or running when finishing or starting a journey in airports, in car parks and stations. On the other hand, however, people using laptops, email devices and camera phones appeared to combine the activity with waiting or having a drink or meal.

By watching people in this way it is possible to see what they do but it is not known why they are doing it; for example, people observed using their mobile phone in shops are heard to be checking out products, colour of clothing or variety of foodstuff - but they may have made the call to distract a fractious child or to make up after an argument. Some patterns in behaviours did emerge from the observational work – some of these have been researched previously in complementary studies such as by DWRC³. When speaking on a mobile people turn away to avoid the gaze of others, or walk to a more secluded location. Some cover their mouth with their flip phone or hide their phone in their hair. People who we assume from their dress to be businesspersons appear to be using laptops and email devices more than mobile phones.

Short vignettes for the observations recorded by researchers are contained in Appendix 2.

Integration with other data

The findings of other research projects investigating the social practices of communications have been included in the assessment process of this study. The various projects referred to are included in the bibliography but a few are mentioned here by way of example.

Social continuity of practices

A review of French research on ICTs referred to the longer-term collective construction of use, noting that the uses of ICTs are always inserted into familial and work practices that pre-exist or are already under construction. The adoption of ICTs takes place against a backdrop of preceding techniques and practices, and new uses are often an extension of what has gone before (Jouet, 2000).

This is why Italian research on camera phones explored how people built upon their experience of a variety of practices - SMS, postcards, photo albums – when exploring what to do with camera phones (Colombo and Scifo, 2003). The trick is then to say how much is similar to what has gone on before and how much is different. For example, Finnish researchers who had given people camera phones to experiment with also noted that postcard-like conventions (such as sending suitable picture to different people) made some mobile visual messages seem familiar. But what was new was often the way it was used in interaction: for some messages the whole point was that you had to reply quickly to the picture. Or to take another example, while people built upon the experience of photography, what was different was that photography was often more casual snaps of the environment

³ Cooper G., Harper R., Green NS, Murtagh G., STEMPEC DWRC Foresight Project UK 1999 – 2002

than in the case of more traditional photography and photo-viewing practices (Koskinen, 2002).

Keeping connected

The importance of communication for keeping connected to one's peer group among teenagers in particular has been a recurrent finding of research. This is a period in life when the social network of young people is growing and when it is important to '*be available*' to peers, infact, being rung up is a measure of popularity (Ling and Yttri, 2002). Some of the youth from this Norwegian study themselves pointed out that nowadays they would be out of touch without a mobile and not '*know what is happening*'. In general, and enhanced later by use of the SMS function, this ICT has created more moment-by-moment awareness of what other peers are doing⁴. In addition the number of names in the dialling register is taken to be one sign of popularity amongst youth (Ling and Yttri, 2002).

The influence of mobile phones on behaviour

In terms of changing behaviours mobile telephony (and SMS) does not only help people to organize meetings but it also facilitates the (re-) organization of the other logistics of everyday life. In describing the elements of their concept of 'micro-coordination', the authors of a Norwegian study include not only the calls to arrange for children to be picked up and dropped off but also mobile phone calls for such matters as contacting people when they have already set off in order to arrange for them to take on some other activity, such as going to the shops (Ling and Yttri, 2002; Ling, forthcoming).

Meanwhile the sense in which mobiles have become part of us is captured in the title of a recent book *Machines that Become Us* (Katz, 2003)

The greater spontaneity enabled by the mobile is also shown in one pan-European study for EURESCOM. This noted that, in general, the mobile phone reduced people's need for planning calls, for thinking about when they would be near a fixed line. Thus, it allowed for "on the fly" interaction with family and friends and a way of simply checking in, not just for co-ordinating but also for constantly renewing relationship with social networks through the 'gift' of a call (Mante-Meijer et al, 2001)

⁴ Noted also by British (Green, 2001) and Japanese research (Ito and Diasuke, 2003). One British study notes the considerable interest which many teenagers have in knowing what their contemporaries are doing and the willingness to accept surveillance by their peers (Green, 2001). It would seem that in the US, where the Internet is more important among youth than the mobile, Instant Messaging plays something of a similar role (Lenhart et al, 2001).

Managing availability

As regards to being willing to discard numbers, Belgian research notes how mobile users are more willing to give up their number than was the case with the fixed phone – for example, as mobile campaigns and tariffs change (Henin and Lobet-Maris, 2003)

It has long been noted that the mobile can also present a problem to be managed by users themselves as they negotiate with potential callers and family the conditions under which the mobile could and should be switched on or off (Ling et al, 1997). However, such negotiations are not always easy and other analysts have observed that one can be called to account for not switching the mobile on (Cooper et al, 2001). Quantitative studies have shown how people control who they give their phone number out to⁵ while qualitative studies have also indicated how people try to keep control of communications by turning the phone off when it rings or let it ring, both actions serving to direct calls to voicemail (Licoppe and Heurtin, 2001, 2002).

The importance of telecommunications costs

Mid-1990s British qualitative studies first showed how the cost of telephony was an issue in many households and Norwegian studies have also illustrated the arguments that take place within the home about the phone bill, especially concerning the use of the phone by teenagers (Ling, forthcoming). British studies suggested that while telephony costs were less of a problem in those relatively more affluent households with few economic worries, it was an issue for more than just the poorest in society. For example, many of the middle-class households studied had limited disposable income, since the parents had committed their money to high mortgages or children's private education. Such lifestyle choices meant they still had to be careful about their expenditures, including telephony ones.

In the 5-country European survey, which built upon that work a substantial proportion of children, rising to nearly two-thirds of British 14-17 year-olds, received complaints about the cost of their telephony (Haddon, 1998). A second question asked about whether efforts were made to control use of the phone. In the European sample, nearly two-thirds of those surveyed sought to use cheaper tariffs or else tried to limit their own use.

⁵ In a French study, 70% only gave their number out to a selection of friends and family, while 30% gave it out freely.

Revisions in the light of the workshops

On completion of initial analysis of the empirical research in Part 2 a series of four workshops were held to which a panel of industry and academic experts were invited. The initial results of the analysis were presented and discussed at these workshops and further insights and validation of the material was obtained. The panel of experts were in general agreement with the results offering further examples and expanding upon the points raised. Complementary studies including empirical research in Scandinavia, the UK and Asia that are not yet published were also discussed and again these affirmed the results of this study.

In addition to the points raised in the workshop that are included in the body of the report there were also some matters that were incremental to the study. The use of telemetry, e-learning and mobile commerce was raised by some of the experts. None of these capabilities featured in the lives of the subjects studied. However, it was felt that telemetry based products might become more prevalent as concerns for personal safety and security increase and that the younger generation users would expect more mobile communications interfaces for commerce and learning in the future. There was also some speculation as to whether 3G as a technology might be leapfrogged by these and other next generation technologies due to bandwidth issues that might be more easily resolved by adapting wireless computing technology (wi-fi/802.11) rather than mobile phone technology. These views are noted in this report as, if they become more widely held, they will have clear implications for the industry.

Table 1. Summary of the three themes from the first study, the hypotheses developed that build on these themes and the investigative themes leading to the implications for 3G/UMTS supplier.

Themes from first study used to research new literature to build new hypotheses	Hypotheses developed in Part 1 of this study defining social practices and believed to be most likely to affect adoption of 3G/UMTS	Investigative Themes used for analysis of empirical data	Implications for suppliers Social practices that will affect or be affected by the launch of 3G/UMTS
<p>Social Connectivity It was found that people use their mobile phones to enable more intensive social relations with already existing contacts</p> <p>Emotion and mobile phones The research showed that users have a more emotional relationship with their mobile phone and its content than with other computational devices and that they express this relationship in emotional terms.</p> <p>Public and Private Behaviours It was found that behaviours by mobile phone users are having an impact on society such that the intersection of public by private behaviours enabled by mobile phones will reach a threshold beyond which resistance will occur.</p>	<p>Intensified use of mobiles for social relations – people are using mobile mediated communications more frequently</p> <p>Communicating in more ways but with people you already know – use of all types of mediated communications but not for ‘cold calls’</p> <p>Person to person communications dominate – use of games, email with enclosures, text are secondary to voice</p> <p>Dependency on mobile phone is changing behaviour – people rely on their mobile phones to resolve issues and have changed the way they do things, such as locating one another via a mobile call on arrival at a meeting place</p> <p>Always connected (actual and virtual). People usually carry a mobile phone enabling them to connect to others at any time. The device is also representative of the constant presence of others.</p> <p>Etiquettes for image & location in infancy – not knowing what to do and what is appropriate behaviour</p> <p>Increasing regulatory intervention – e.g. fines for using handheld mobiles when driving; audible ‘click’ on camera phone</p> <p>Converging behaviours and combining ICT –using familiar devices and capabilities rather than adapting to a new multifunctional device</p> <p>Mobiles are for play and for functionality. Use of mobile devices for playing games, for having fun as well as for keeping connected is anticipated.</p>	<p>Keeping Connected: people are intensifying their social relations through their use of mobile phones</p> <p>Mobiles are Changing People’s Behaviours: people are so dependent on their mobile phones in particular that it is changing their behaviours and affecting them in their day to day lives</p> <p>Behavioural Convergence: people are mixing and matching multiple ICT in a personal way such that they have converged the use of devices – fixed and mobile – to suit their own unique lifestyle and ways of doing things.</p>	<p>Financial Control – The development of communications strategies by users to leverage maximum cost effectiveness for them</p> <p>Managing Complexity The increasingly complex use of multiple modes of communications in families and how this is negotiated influences their adoption and use of services.</p> <p>Exploration of the new The role of the user explorer in the adoption of 3G.UMTS products and services</p> <p>Uncertainties surrounding image The historical role of image in everyday lives and how it might shape adoption of picture and video messaging</p> <p>Personal Preference in business practices The position of present day mobile communications within numerous layer of ICT in the workplace</p>

4. Defining Implications for 3G/UMTS Suppliers

The repertoire of mediated communications and the continuing social practices that prevail despite the arrival of new technologies provide the backdrop for the implications for 3G/UMTS suppliers.

What has been found is that the implications overlap the investigative themes. Firstly each of the implications is affected by the needs reflected in the first theme of Keeping Connected. Secondly the theme of Mobiles are Changing People is reflected in the implications regarding financial management and complexity of use, but also, to some extent, in the role of the user explorer and the influence of the history of image. These latter two themes are also examples of Behavioural Convergence, together with the implications regarding the position of present day mobile communications within numerous layers of ICT. A description of these five key implications for suppliers is discussed in the remainder of this section.

1. Financial Control

The development of communications strategies by users to leverage maximum cost effectiveness for them that in turn minimise additional revenue potential for suppliers

It would appear from this and other background studies that many people have developed an acute awareness and sensitivity to the cost of communications. While some people continue to make relatively few calls, and hence do not need to be so sensitive to cost it is when we turn to the group of intensive users, as in the families studied, that practices that flow from this are demonstrated so dramatically. The tariff bundling has led to the development of 'free calls'. These calls, data volumes and text messages are of course not free, being packaged in the monthly fee, be it contract or prepay. People, never the less will seek to find ways to use all their available minutes, messages and data volumes even if this involves sharing with others, or not using the device when money runs out. Business people employ similar strategies to minimise personal cost to them using communications media paid for by their business rather than themselves whenever they can. Perhaps of most significance to the supplier of 3G/UMTS is that although these changing strategies for the management of mobile communications demonstrate not only a greater sophistication amongst the groups of users they would also appear to increase the number of calls made. However these changes in behaviour do not appear to be generating new revenues. When you see how much the families in particular are trying to save through their extensive knowledge and management of their available minutes and messages then it must indicate that charging a higher price for 3G/UMTS services in isolation from existing tariff bundling is unlikely to work. This financial

management of mobile communications is shaping the adoption of new services and of mobile phones in particular. Potential 3G/UMTS customers are unlikely to be interested in new services unless they are presented to them as an upgrade or 'better deal' than they already have, or can obtain from another provider. It will take something dramatically different to get prospective customers of 3G/UMTS products to spend more overall on mediated communications than they are doing today and whether or not they are truly knowledgeable about tariffs the important point is that they are acting on perceived economic considerations.

2. Managing Complexity

The increasingly complex use of multiple modes of communications in families and how this is negotiated influences their adoption and use of services.

All three generations of families are now likely to have a mobile phone and other mobile communications media, but this has happened only recently. Families are accustomed to sharing their ICT and although they may each have a personal mobile phone this sharing even extends to that device. The repertoire of communications options available to members of the family group is increasingly complex. The use of mobile communications is interleaved with their fixed line communications and either may be used, as well as text and voice, to ensure contact is achieved whenever needed. Strikingly it would appear the complexity is driven by factors such as parental control, family budgeting and tensions from peer groups external to the family. The start up of a relationship might lead to a change of service provider with tariffs preferential to the couple. However, the finesse of maximising the benefits of the family's communications capabilities cannot be underestimated and it is in a constant state of flux. If their providers of service offer them new options they try out new things but apparently not all at once. They might, for example change tariff or change provider but whatever they do it will mean their behaviours will change. Such factors as the time of day availability of 'free minutes', the numbers of free texts and who in the family has the new service influence behaviour. New technology such as the mobile camera phone is acquired 'for the family'. In addition there is a lot of sharing of resources by the family such as the collective sharing of family photographs taken on the camera phone and downloaded onto the family PC. This complexity is being extended beyond the nuclear families at the heart of the study as older generations fit into the world of mobile phones and become a part of the complex negotiation with other mobile mediated communications. Supplier recognition of the behaviour of the family group of users may better inform the design of products and services so that they more closely meet their needs.

3. Exploration of the new

The potential role of the User Explorer in the adoption of 3G/UMTS products and services.

In relation to previous generations of mobile phone the traditional early adopter of a new and sophisticated technological product has been seen as the technologically capable user tolerant of mistakes and early difficulties. This study revises this picture somewhat to draw attention to people who are more interested in what the product can do for them rather than how it does it; indeed the mystery of how it happens is, for some, part of the excitement. These are the people referred to as User Explorers. They expect to be able to push and play until they achieve their goal but expect a simple interface that enables this with minimum button pushes. To some extent everyone is a user explorer but perhaps some users are more willing to try things out more often than others. Being able to feel that they have mastered the new capabilities on their own would appear to be key to their satisfaction with the new product.

An increasing presence and acceptance of 'high tech' and 'digital' products and services in everyday life has meant that technology based products are the norm and form factors that accommodate the less skilled user mean that people are more content to buy the latest technology. They are happy to push and play until they find out what it can do and if it fails to satisfy they discard the difficult facets of its capabilities. User explorers are therefore important in developing new social practices and thus in the take up of a new technology such as 3G/UMTS

The examples of user explorers are not limited only to members of family groups but appear in business teams too where individual team members upgrade or acquire new products even though they are not necessarily required for their job.

4. Uncertainties Surrounding Image

The historical role of image in everyday lives and how it might shape the adoption of picture and video messaging

Image, and in particular the reproduction of one's own image, has had a role in many people's everyday lives for many centuries. Different techniques of reproduction have been used such as paintings, sculpture, and, since the 19th century, photographic image. The camera phone is a new genre in this evolution and is beginning to find a place in households as the instant record of an event, kept on the phone as a memento or downloaded onto a PC (but not yet sent to others). People are beginning to explore what possible role it might have for them – to a lesser or greater extent. They already know about cameras and so apply this knowledge to using camera phones. In so doing they are discovering they can integrate it with other ICT such as blue tooth and

home computers and may even use the camera phone as a substitute for a conventional camera in some instances.

Ironically the slow penetration of camera phones has not dampened people's initial enthusiasm for the product but early findings from Japan and Italy where image products are maturing but picture messaging is not increasing would appear to demonstrate that people have yet to discover a need to send the images. Improved picture quality and increased recognition of their value in the workplace for purposes such as to replace existing cameras or business cards or to supplement notes have yet to fully emerge. The impact of legislation to regulate the use of camera phones has also yet to be understood. There is no etiquette yet for taking pictures with a camera phone but already there is resistance. New understandings and etiquettes will develop over time that state what might be deemed inappropriate or unacceptable use of camera phone. However, as a result of misuse in Korea and Japan camera phones must be fitted with an audible 'click' that cannot be disconnected and thus the etiquette is already being determined by misuse and legislation leaving little room for appropriate social practices to develop in their own right.

5. Personal Preferences in Business Practices

The position of present day mobile communications within numerous layers of ICT in the workplace

As with families business mobile communications are interleaved with a variety of other ICT – fixed and mobile. Business people tend to use the type of device and technology that best suits them and so long as their employer maintains the range of capabilities they prefer they will continue to do so.

The mobile phone and other forms of mobile communication have mixed relevance in the workplace. Although it may be important to have a mobile in order to be contactable by others in an emergency or to phone ahead to make new arrangements due to delays, the mobile is quite often only used to maintain social contact with family friends and business colleagues. Indeed it is frequently used as a means of managing home and social life issues during the working day and for some it is their sole means of communicating in all aspects of their life.

What is clear from the research is that there are multiple layers of ICT in the workplace, some imposed by employers and others chosen by the work force. The arrival of 3G/UMTS will therefore most likely complement and add to the existing portfolio of ICT rather than replace it. Companies who reach their customers by a variety of mobile mediated communications will most likely seek to have 3G/UMTS in their repertoire of capabilities so that they are in a position to understand the needs of their own customers and be in a position to reciprocate on the same media.

5. Investigative Themes

As has already been described these themes have been used at the basis for exploring and examining the research material and in particular the data gathered in the empirical research. Each of these themes was described in terms of hypotheses and although these have been validated to some extent they have also understated the impact of the social practices associated with each theme. Keeping Connected, it transpires, is not just about intensifying social relations although these are the primary motivation, but it is also about being always available and by means other than just the mobile phone. Mobiles are Changing People's Behaviours talks about how their ownership is influencing the lives of people who don't own one, as well as the behaviours of those who do. Further it is more than mobile phones that are changing people but other types of mediated communication too. Finally looking at Behavioural Convergence has revealed just how many different types of mediated communications people are using. There is a final irony in that despite the plethora of technological changes and advances that make these devices and services more trustworthy people are still using plain old pen and paper to back up or complement their state of art ICT.

Theme 1: Keeping Connected

All of the groups explored in this study, and the families in particular, are intensifying their social relations through their use of mobile phones. Indeed they have developed strategies that enable them to maximise the use of all their communications media and in so doing have increased their usage. The business users also appeared to have increased their communication but by using more than one media, e.g. letter and email, or voice call and email, to communicate with each other and their customers. The use of mobile phones in the work place was as likely to be for keeping up with family and friends as it was for doing business.

Findings

- Family, friends and work colleagues expect to be able to contact each other at all times
- People are controlling who has their mobile phone number and email address
- Business people use various ICT to negotiate their availability but are harassed by others who expect instant contact

In each of the groups of users examined the desire to remain in contact at all times was, in most cases, paramount. However, because family, friends and work colleagues expect to be able to contact each other at all times it can also lead to irritations.

“My husband will ring my mobile if he calls the land-line and it is engaged - it's really annoying”

“Sometimes my Mum will try my mobile before I've even had chance to get to the landline - she assumes I'm out”

Laptops with wifi or email devices are used when out of the office and mobile phones are carried at all times because people are expected to be contactable. For some contact with family or to deal with late arrival at appointments is all they are use for whilst for others they have become a total substitute for the landline at home and in the office. In the workshop discussion it was noted that keeping connected included being able to reach each other at times or in places where previously this was not possible, such as in school or when on a journey. While this has benefits it may also create the potential for surveillance and this might be unwelcome. On the other hand the older generation family members may welcome this surveillance as a backup in case of medical or other type of emergency.

Even though many people do carry their mobile phone with them wherever they go their communications are frequently prompted or denied by the need to maximise or optimised the use of bundled tariffs and minimise unnecessary expenditure. This affects the time of day and the type of communications media that is used and how long they might talk to someone who is not on their network tariff of free minutes. Even though the free minutes are paid for as part of the monthly fee it has become a challenge to maximise the use of the free minutes to the extent that family members will share phones in order to use up the minutes. This has the effect of intensifying the communications within these social groups; it is also shaping their decision process about when and whom they will call, text or communicate with in some other way, and when to use another medium. Whether or not they are knowledgeable about the tariffs is irrelevant the important point is that they are acting on perceived financial considerations. This sensitivity to the financial control of communications is relevant to both themes of ‘keeping connected’ and ‘mobiles are changing behaviours’.

“I called in at my mother's house and used her fixed line while I was there – I wasn't going to use up my mobile minutes and she was paying!”

An example raised in the workshop is the teenager who changes her tariff with each new boyfriend so as to find the most economical way of keeping in touch with each other for the maximum amount of time.

There are some tensions regarding when to use a mobile phone or when to call someone on their's and people are controlling who has their mobile phone number and email address.

"It's more difficult getting in touch with people now - they are more reluctant to give out their mobile number or their email address to businesses"

Although it has been quite common for mobile phone numbers to be given out by their owner to people they know it would appear that people are now appropriating the same sense of private ownership to their email addresses both for control of access and to bar SPAM. Some people avoid interruption by others by only switching on their mobile by arrangement or do not have one at all (and have no intention of buying one).

Business people like to negotiate their availability but are harassed by others who expect instant contact.

"I switched my mobile off for three hours and had 30 messages in that time"

"You never get through to someone first time these days; there's always an answer-phone or a divert to someone else"

This tension between keeping connected and not wanting to be contacted has meant new etiquettes are emerging in business that accept the use answer phones or transfer to mobile phones. Keeping connected in business may be experiencing a back lash from those who don't want to be accessible all the time whereas keeping connected with the social groups of family and friends is burgeoning.

Theme 2: Mobiles are Changing People's Behaviours

The empirical data gathered supported the hypothesis that people are so dependent on their mobile phone in particular that it is changing their behaviours and affecting them in their day-to-day lives. Surprisingly some business people were found who did not own, or who rarely used a mobile phone, but even they had to adapt to the expectations of others who did.

Findings

- People have become as dependent on others having a mobile phone as they have on owning one themselves.
- People have learned to walk (or run) and talk or text but are not yet doing so with image over mobile devices.
- Use and take up of new mobile ICT appears to be being shaped more by users response to tariffs and the cost of communicating than by technology but many do want the newest phones
- People appear to use the mobile phone to 'live the moment'
- Use of mobile phones has reinforced the sense of constant presence of one's family and friends

"I could manage without a mobile but my wife likes to know that she can get hold of me - and she does call me most days"

"We use our mobiles to call each other because it is cheap"

"I have a friend in Manchester who I can call anytime of day now rather than wait to after 6pm"

"I use my son's mobile because he's got cheap tariffs"

"I used WAP because it has free minutes - I wouldn't have used it otherwise"

"I'm on my mobile- can you call me back?" (so business pays for call)

"I'm not getting a new phone because I'm on an old tariff that gives me free calls and I'll lose it if I change"

The first indication that mobiles are changing people is in the changing perception that the mobile phone was viewed as being something only the owner would use. Perhaps it is the lower cost of calling a mobile or simply the need to contact others that has resulted in people being more dependent on being able to contact someone on their mobile. This is

the same for family, friends and business colleagues. In the couple of instances where the business man did not have a mobile phone his colleagues found it very difficult to know what to do as people would expect to be able to contact him when they were out of the office, not least to inform or be informed of late arrival at a meeting.

The second area of emerging change is in the way people are learning to combine the use of new technologies with other activities. The use of pictures on mobile devices is still something that people will do sitting down or when stationary – much as they did when they first got a mobile phone. People probably never imagined that they would be able to text and drive at the same time, run and talk on the mobile phone – or, as was observed at London and Brussels airports recently, many people running down travelators talking on phones, getting out boarding cards and avoiding others at the same time without incident. At the moment it is difficult to imagine that anyone would want to do this with image but maybe some will.

In the workshops one participant proffered another example of changes in behaviour that might not have been anticipated when camera phones were launched.

“I use my camera phone if I haven’t got a mirror. I can take a picture of myself and then I know what’s wrong – I know it sounds crazy but it works perfectly.”

“We were visiting someone’s house and standing in the kitchen...and we liked the knobs on the kitchen door ... he said ‘Take a picture’...it was so funny...I felt like a spy...but it’s a really good use because we can always remember what we liked about it and can show it to designers”

There are some behaviours that are unlikely to be changed by mobile communications and these involve the use of pen and paper. It as if the pen and paper are the last bastion of trust and personal control and, even if only used as a back up, they are still very prevalent in the work place in particular. The impact of the loss of data about appointments is possibly less relevant to family life, although perhaps not to social groups of friends. Examples of this continued dependence on pen and paper are the printing out of weekly appointments from their computer/PDA and making updates on the paper copy; business cards are still exchanged and kept as back up for electronic cards or emails and documents printed out to read and store.

A third area of changing behaviours is in the way that the mobile phone, and for some wi-fi access to email, have reinforced the sense of the constant presence of one’s close family and friends. Further people appear to be living the moment through their use of mobile communications and the phone in particular. This points to a change that has occurred as a result of the increasing intensity of keeping

connected. For some life has become a continuous conversation which can only be turned off by walking away from the device or telling the person to stop.

"I'll go to lunch and leave my mobile behind, switched on, on my desk. Colleagues know I'm coming back and I can see what calls I've had while away"

A more negative aspect of constant presence was raised in the workshop regarding research in the Netherlands that has reported SMS was changing teenagers sleep patterns.

"I text my boyfriend to tell him to stop texting me 'cos I wanted to go to sleep!"

This sense of being physically closer to each other might account for the different frame of reference for their location that people using mobile communications appear to have from those they communicate with in a fixed location. *"Where are you?"* expecting an answer with a place name is answered by *"I'm on a train"* or *"I'm in the car"* reflecting actual location.

"My son texted me from Russia to say there was a problem. I panicked and made loads of phone calls but really he shouldn't have texted me at all". The son was using his mobile as if he were near to his mother. However, the mother, being in the UK, was completely unable to do anything and was not able to assess how serious the problem actually was. She thought it must be serious because he has texted her from Russia and she is in the UK. It transpired that it was not serious. She was annoyed because she had been caused a lot of worry unnecessarily. Thus the mobile phone enabled the problem to be shared – the intention of the son – but not in a way that could be resolved at that distance by the mother who could not deal with it in the same way as she would had her son been physically closer to her.

Mobile ICT is not always a complete substitute for past practices - people like to keep a foot in the past and use familiar practices and this is perhaps manifested in the next theme of behavioural convergence.

Theme 3: Behavioural Convergence

Convergence is a term used in telecommunications to mean the combining of technologies either in devices or within the infrastructure thereby creating converged capabilities. When it comes to digital technologies convergence becomes possible at different levels and can be managed by the user and this is the Behavioural Convergence that is discussed here. This research theme asserted that people are mixing and matching multiple ICT in a personal way such that they have converged the use of devices – fixed and mobile – to suit their own unique lifestyle and ways of doing things. All the groups of users demonstrated this behavioural convergence to some extent but it was most prevalent in the business teams for whom there was a plethora of ICT and paper to choose from.

Findings

- There is continual interplay between ICT devices and with paper but not all are in constant use
- New technologies are added layer upon layer into people's daily lives
- There is asymmetry of mediated communications as people select the most appropriate technology that best suits them or the person they are communicating with
- Familiar devices and technologies, analogue or digital, are used for important or specialist events

Familiar devices and technologies are used for an important or specialist event and there is no doubt that people like the familiarity of the old ways of doing things. Mobile ICT, whilst providing an essential tool for maintaining social lives and urgent and emergency calls is still not used for those important business calls, or when the initiator of the call is concerned about the appropriateness of the location of the recipient. An important call or personal text received during a meeting or on a bus for example may not be welcomed.

"I've got a mobile here and yet I just got up and went to another room to make a call to a prospective client on a fixed phone - I called him on his mobile!"

Numerous examples of behavioural convergence were found during this research. Sometimes these might be different applications for the technology that was at first envisaged such as the combining of picture display when making/receiving a call that links the image of the person with the directory containing their details or the taking but not sending of photos and showing to others. In both of these instances the sending of the image taken is not a prerequisite for the use of that image. This has revenue implications for the providers of the service who are

expecting more images to be sent than current practice would appear to be generating.

Other examples are the transferring of phone numbers, addresses and appointments manually and remotely between PDA, mobile phone and computer. Paper as a back up and to update ongoing changes to diaries reflected people's lack of trust as a result of system failure and also the fact that portable devices have not yet replaced the speed and flexibility of the hand written note. Music and ring tone downloads were becoming more common place both for mobile devices and the desk top PC as was using a mobile phone as a clock, a radio, or personal organiser much in the same way as a desk top PC is used. There was, however, little evidence of people using their mobile devices to play games – for some this was a battery life issue more than a lack of interest.

There doesn't seem to be resistance to new technologies – but people do like to keep a foot in the past not getting rid of old equipment, handing last year's phone on to someone else in the house, keeping old computers for backup at work, and expanding the volume of work with new databases, intranets and timesheet management.

It is clear that as different types of technologies become interoperable the asymmetry of communications will increase. In other words calls made on a mobile are not always made to a mobile, or an email sent might be received on a laptop or a mobile internet device, or alerted by a text message. All this will make prediction of call volumes more difficult until patterns in usage develop. It is not always a matter of tariff but more often down to the type of mediated communications the recipient prefers.

'I always use my mobile but my mum prefers to use the fixed phone. She starts with the fixed phone, tries the mobile and then text' - some will also include email and letter in that equation.

6. Examining Groups of Users

The UMTS forum had specifically requested the research include people who were users of 3G/UMTS type products and services. Participants for the fieldwork were therefore sought who at least had camera phones and preferably video phones, who used them in their social groups (including at work) and who were users of other types of mobile ICT such as laptops with wi-fi. This proved more difficult than anticipated.

“Yes I will be buying a picture phone but not until the tariff comes down - it’s bound to, and I want the latest phone that’s coming out in January”

“My children have the new picture phones but I don’t have one yet”

The situation was no better in business teams – in fact it was quite a bit worse with much less penetration of 3G/UMTS type services in businesses approached outside of the technology sector and not much more within it.

“I don’t think we are the ‘bleeding edge’ technology company we make ourselves out to be! Nobody uses wi-fi much, nobody has a camera phone; whilst about 50% have laptops, most stay tethered to their desks. I suspect we might not be the best company for your needs”

On a positive side there is some evidence that people are talking about pictures and video over mobile and might well be intending to buy. They are challenged by the technology but somehow it has captured their interest – airport lounges are littered with people with laptops on their knees, mobile Internet devices in their hands and, in some cases, instruction books close by. There is an expectation that the service will work and acknowledgement that it is better to wait until it does this time. Some devices appear to be the trigger for purchase; it looks cool.

“Me and my boyfriend bought new video phones - I spent over £200 in one month! I don’t know what I was doing - I’ll have to change my tariff or something”

“We’ve got 2 camera phones in our family and we share them. None of our friends have got them yet so we can’t use them much”

“My work phone is a camera phone, I got it to experiment with but I don’t need it for my job”

“I’ve got a new phone with icons and everything - it’s taking me ages to work out how to use it but I’m persevering!”

Over thirty people participated in the day in life study – these included three members from three generations in three families –but as we will see not all are 3G users; two business teams who were extensive users of ICT but as yet little evidence shown of 3G type services and Technology Explorers – individuals who are enthusiastic, technically knowledgeable and sophisticated users of all types of mobile and fixed ICT.

More people kept diaries for a day and were interviewed about what they did and around eighty contributed to workshops and interviews. Finally DWRC's researchers have visited to different locations and observed what people are doing in their everyday lives in streets, shops, public transport and social and leisure situations.

Group 1. Families

- They need to keep connected and use the mobile phone to reassure each other and avoid risk
- Parents in particular use the mobile phone to manage their day changing it as they go
- Families have and use all types of ICT and have developed complex strategies for getting maximum use from their spend on communications
- Children's use of mobile phones is limited by parental control as well as budgetary constraints

Findings

Three generations of three families kept a diary on the same day and were interviewed about them; the families live in the south east of England in the London area. They all used mobile phones as an integral part of their daily life, at least one person in the family had a camera phone and one family had two. They would swap around their mobiles as old models were traded in although one grandmother had never changed hers and her daughter couldn't understand why. None of their friends had camera phones so they could not exchange images – this was the usual response from people spoken to during the research who had camera phones. They found games used up the battery too quickly. They also had tight control over the expenditure and knew the costs of their calls – even if it was by how quickly they used up their monthly allowance.

There seems to be no doubt that mobile phones and other communications media – cordless phones, PC's, laptops – are embedded in their daily lives but as yet the use of image is still in its infancy. Given disposable cameras to take photos of each other during their diary day they didn't really know what to photograph. This might give a hint as to what they might – or might not – use their camera phones for in their everyday life. Because they couldn't send the

pictures they had taken on their camera phones to anyone one family had started to use the camera phone like a conventional camera to take holiday snaps that they downloaded onto the computer. This was also pointed out in the workshops when it was noted that people take and show pictures but do not take and send.

“Playing with wap is a time filler and I texted in the car coming home because you get bored otherwise”

“She uses her mobile at home rather than the landline because her tariff gives her free off peak minutes”

Families need to keep connected and use the mobile phone to reassure each other and avoid risk, such as the daughter texting the mother to confirm she had arrived safely at school via public transport. Frequently busy and with conflicting demands on their time parents, and the mothers in particular, use the mobile phone to manage their day, changing it as they go. Children appeared to be heavy users of all types of ICT and some were the first in the family to get a camera phone; peer group pressure does have an impact on their behaviour but they are constrained by their limited budgets and by parental control. Members of workshops commented that parents find that they have fewer precedents to draw on for negotiation, as mobiles were not around in their youth. Older family members are being drawn into the mobile world by being able to contact their family more easily, and each other - especially in an emergency.

In summary the families had needs for mobile phones that differed a little between generations but in principle were based on the same needs of connectivity, reassurance and to avoid risk. They used them quite differently within their own social groups. For example the oldest generation tended not to use their mobile phone to call friends whilst the children's volume of use would have been greater had they not been influenced by their tariff, budgetary and parental control. The middle generation mothers were the most intensive users calling friends during the day and keeping their mobile phone with them because their friends used it to contact them. It was pointed out in the workshops that the mobile phone has empowered mothers and enabled them to regain some time for themselves by being contactable away from the home. Another workshop participant commented that given how much women used mobiles maybe it was time more products were offered that women wanted.

“I don't want to check the football scores on the way home, I want to do my shopping”

Three case studies based on the Families researched are included in Appendix 1.

Group 2: Business Teams

- Old and new work practices prevail alongside each other
- Multiple devices are commonplace but not devices that combine multiple functions
- Workers communications go beyond work and have to do with their home life, social arrangements and more
- Mobile communications are used to help develop strategies for marking space
- Camera phones have little presence in the white collar work place

Findings

Two business teams were shadowed for part of the day and several workers kept diaries from other organisations. As was noted earlier finding business teams that all used 3G type products proved impossible. Although asked by the Steering Group to seek candidates for the research from outside the UMTS Forum membership the researchers did approach some telecoms companies but still found the penetration of camera phones very limited; and although there are some heavy users of mobile email and WAP; this is not the norm.

“I don’t use my mobile much for work - I just have it on me in case I am late for a meeting or my family need to contact me - which happened last week and it was invaluable”

Both of the organisations shadowed appeared to be typical businesses in that they had almost every type of ICT in their office and one or two people who were avid users of the latest technologies and others who hardly touched them.

“We have two lap tops with wifi that we share, you need to talk to Mike, he’s the mobile communications expert but he’s on the road all the time, and he’s out today”

“I always back up on paper and have a back up memory chip too - this pda lost everything once and I was stranded”

“There is no way I could get rid of my (paper) diary - it’s my bible”

Business people had adopted new practices (e.g. using computer data bases and diaries) and devices (e.g. PDA, laptops) but did not appear to give up old ones such as replacing out of date mobile phones, discarding old computers, printers and fax machines or dispensing with the paper filing systems and diaries. The old and new work practices prevail alongside each other. Multiple devices are commonplace but not devices that combine multiple functions. It was apparent that workers

are constantly juggling their home life managing traffic conditions, social arrangements and childcare and the mobile phone played a key role in making this combination of work and home life manageable.

The business teams shadowed for this research used shared open plan offices and one team had a 'hot desking' policy. The workers had adapted to this and in so doing shared their work practices and work places - but they were territorial and used mobile communications to help maintain this such as by leaving the phone on their desk whilst at a meeting or at lunch. The phone is left switched on so that the owner knows if they have been called. The phone is left on display as if to say '*I'll be back later*'. A workshop participant confirmed this behaviour from her own experience and another that it had also been observed amongst art students in their studio space

It was noted that camera phones had no presence in the white-collar work places shadowed but it is apparent from other studies and from the workshop discussion that other workers are using. For example service workers like plumbers and builders and in the case of one of the families, someone fitting blinds, who all use them as aides memoirs but not to send pictures.

Two case studies based on the Business Teams researched are included in Appendix 1.

Group 3: The Explorers

Findings

- There are two types of explorers. User explorers are more likely to be early adopters of 3G/UMTS products than technology explorers
- Technology explorers are more complex users and do not always upgrade but explore the limits of devices and systems they own or can get to use
- Technologies do offer a means of developing social lives
- User explorers are less tolerant of useability problems than technology explorers

Technology Explorers

Two people were accompanied on a trip to a wind farm where they were collecting video footage for a music video they were producing. Others were interviewed face to face or on line - many do not have time to be in their offices and do paperwork. They work where they can.

“We met at an event set up via an online discussion group”

Technology explorers should be the early adopters of 3G type services but the frustrations of finding out about the products – getting enough data on them from the manufacturer and on-line discussion groups – would appear to hinder them. (as well as cost). One participant had become disinclined to use his communicator because he could not find out enough about it. As with the families who found games ate battery life, the use of bookmarks was perceived similarly and URL's remembered rather than stored.

Technology explorers overlap their ICT use between fixed and mobile and a variety of devices; they also look for cheap ways to maximise the potential of the devices. They have a thirst for understanding, unpacking and talking about the equipment, what it can do, how it does it and how it can be integrated with other devices.

“What are you doing?” “Oh, just seeing how this stuff works”

“I'm much more emotionally attached to my laptop than to my mobile phone”

“I tend to use text and instant messaging most because it is cheapest. I only phone when I have to”

They are affected by the tension between the capabilities of the technology and their own creative uses for it. Technology explorers use a vast array of devices and systems to communicate with their social networks. They will find the cheapest access to the various

devices that they like to use - this may be by time of day or by using equipment owned by others.

In summary the findings from examining the data gathered about the technology explorers showed up in particular the tensions between the capabilities of the technology and their creative uses for it. Text, instant messaging, calling, on-line discussion groups all provided a means of meeting and keeping connected with each other but the cheapest method would do.

Two Case Studies based on the Explorers researched are contained in Appendix 1.

User Explorers

The technology explorer discussed above is a type of user that the supplier of 3G services is familiar with and one that is expected to be an early adopter. However, the researchers believe that there is another – the User Explorer – who might also be an early adopter. These are the people for whom the technology is completely irrelevant (except maybe to know that it is new). They are entranced by what the device can do and the difference it makes to them and how they are perceived. There are also some very practical issues like keeping down costs and getting your monies worth.

‘What I’d really like is a tariff that works the same across international boundaries - is there one? It is so expensive to keep in touch with my family now I have moved abroad and we can’t text all the time’

‘I only get 50 free texts a month so I call people when I’ve used them up and towards the end of the month I slow down’

‘My aunt, well she is deaf, and she discovered text and now everyone in my family, all ages, have learned to text and are keeping in contact with her more than they did before’

User explorers do not understand the details of the technology and have no real desire to. They will scroll through the menu until they find a way or ask a friend to show them. However, they may be put off if it takes too long, such as the number of button pushes to take and send a picture message. They are driven by a need to keep down costs and increase personal efficiency. They like to have the ‘latest thing’ especially if it is in fashion. It might be the influence of this type of user that could speed up the adoption of 3G

*‘It was her idea, I’d only just got the phone at the time and her eyes lit up! – She suddenly realised that she had the means of doing this and we gave it a go and it worked... I don’t know how it happened’
(transferring images between cameras)*

8. Conclusion

This study set out to investigate existing social practices of users of 3G/UMTS type services and what could be learned from them to inform suppliers to better prepare for their future customers. Whilst the number of users of these new services is still low, and thus their experience difficult to assess, this study has none-the-less discovered a great deal about the social practices that will impact the successful launch of future 3G/UMTS products and services. These defining social practices manifest in the five implications for the suppliers that form the final conclusion of this study. These implications are:

Financial Control: the development of communications strategies by users to leverage maximum cost effectiveness for them

Managing Complexity: The increasingly complex use of multiple modes of communications in families, and how this is negotiated, influences their adoption and use of services.

Exploration of the new: The role of the user explorer in the adoption of 3G/UMTS products and services

Uncertainties surrounding image: The historical role of image in everyday lives and how it might shape adoption of picture and video messaging

Personal Preference in business practices: The position of present day mobile communications within numerous layers of ICT in the workplace

These implications are the concluding outcome of the assessment of the research that commenced with the development of initial scenarios for the empirical research that largely reflected stereotypes and aspirations within the industry. As might be expected, in reality the picture is mixed, with some support for those visions but also some surprises. Families may be using communications media more but what is happening in families is far more complex and leads to some pressures to constrain use or at least adopt complicated strategies to keep down costs, and maintain parental control. Looking at Businesses what was found was that people may be using communications media more, but they are certainly not embracing all that is new, and at best innovations tend to complement rather than substitute for existing tools and practices. It also showed that while technological enthusiasts may be interested in exploring technology they are not necessarily geeks; they can be critical and they face similar economic constraints to others. In examining this group it was found that people who are not knowledgeable or not interested in the technology can also be interested in exploring new products and finding out what they can do. These 'user explorers' are likely to be early adopters as they buy 3G/UMTS for what it can do for them, even if this is merely a fashion statement.

The research has clearly shown that people are managing an increasingly complex repertoire of communications options and practices within which the fit of 3G/UMTS is still unclear but not barred. There are examples of the ways that they are still experimenting, deciding different strategies in different circumstances and reviewing their position occasionally, and these are the leverage points for introducing something new. The impact of financial management and the desire to put a limit on monthly spend on mediated communications has penetrated all aspects of the social practices discussed in the report. Some examples were found of people getting a shock when they received their bill realising that they been carried away with a new service such as using video. It would appear that they might be willing to let the bill increase but not for the same reason and maybe not every month; it might be for sending picture images one month and then in another it is for extra text messages to keep in touch with someone who is temporarily away.

This willingness to try out new things is of particular importance at this juncture in the rollout of 3G/UMTS. At this time of technological change people have become accustomed to not fully understanding how everything works but being able to use it despite this. The technology enthusiasts are still active but they haven't finished exploring the details of some of the prototype technology that has been around for a while and some are not ready to move onto something new. User enthusiasts however have become accustomed to low price handset upgrades, at least annually, and are happy to explore what the latest model will do if it meets their needs; how it does this is immaterial. Set against the backdrop of rising costs to deliver more intensified communication they have found ways of exploiting or maximising their bundled tariffs, even to the extent of sharing left over time and data with family and friends in the case of mobile phones, or by not using it as much in other instances. It would appear that new 3G/UMTS handset would more likely be used if they are priced in the same way as if they are an upgrade of 2G or 2.5G. Different price structures for different technologies will add another layer of complexity that most users could do without.

On the positive side the families interviewed would acknowledge that they simply communicate more now although this might not be true of all society. This higher connectivity does have some implications for how new 3G/UMTS products might be introduced. There are tensions between the desire for increased connectivity and the knowledge that with 'always on' capability they are expected to be always available. Methods for mitigating this and for separating social and business communications would relieve some of these stresses.

Looking to the future there are a number of emerging topics that would benefit from further research in order to more fully understand their impact. For example monitoring of the use of camera/video phones as

the numbers increase to see how the use of image develops would give some indication of whether the current uses are merely transitional and that people will 'take and send' rather than merely 'take and show' as they do at the moment. Another aspect is whether the effort to keep down costs found in the UK is prevalent in other countries and if so what can be learned from the strategies that people adopt to manage their spend.

This study has investigated groups of users to a greater depth than more conventional research would go and in so doing has generated a great deal of material. This, together with the supporting data including the contributions from academic and industry experts, has provided some key implications on which suppliers of 3G/UMTS can act to better prepare them for their customers.

Informing Suppliers about User Behaviours to better prepare them for their 3G/UMTS Customers

Part 3 Final Report: Assessment and Analysis of Findings

APPENDICES

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Appendix 1 – Case Studies

Family Case Studies

Case Study 1: The Davidson Family

Lyn, 37, is married to Steve, with two sons, Kevin, the eldest and Brian the youngest; Lena is Sharon's mother. The main focus in this case study is on Lyn and Brian.

The day of the diary

Lyn woke up around 8.30 – it's going to be a long and exceptional day because that evening Lyn and Steve are going out clubbing to celebrate a friend's 40th birthday. Lyn had a cup of tea in bed and read the papers. About 9.00 Lena rang – she usually catches up with things on a Saturday. Lena called Lyn's landline from her own mobile at home because Lena had free weekend minutes on her tariff. Lyn could not talk to her immediately and so she said she would call her back. Then her sister Sue also rang her on the landline for a chat. The sisters are so busy with school and young kids during the week that they often ring at the weekend.

Lyn finished the newspaper and got up around 10 to get breakfast for the family. While she made breakfast Lyn returned her mum's call. She used the mobile because she, like her mum, had free weekend minutes so it was cheaper than using the landline. After breakfast Brian went off to check his e-mails. He could usually expect a few from school friends, but this was Saturday and so he also had the news service update for Watford football club, to which he subscribed.

Lyn went back upstairs, showered and got dressed. A friend called her on the mobile – many of her friends call her mobile and so she takes it around the house with her - they could call any time. She made the beds, got the boys together and, leaving Steve at home, they headed off in the car. There was much more traffic than expected and so she called her friend to say that they were delayed and then rang the hairdresser to check her appointment time – it did not cost anything on her tariff. She asked Brian to check his wap mobile - also with free minutes – in order to get the telephone number of a shop they wanted to go to, in order to see if it was open. He did not manage to get the number from the on-line yellow pages. Some time later, when at his friend's place, he experimented again and this time was successful.

Leaving the boys at the friend's house, Lyn went to the hairdresser for a quick haircut. No one rang her while she was in there. Next was a quick trip to drop some food off at her Mum's –but her parents were both out when she got there. She let herself in to her Mum's house and

used her Mum's landline to phone her Mum's mobile to ask where she was – that was cheaper than phoning from her own mobile to her Mum's mobile. Her Mum and Dad had gone to one of their friend's for lunch. Lyn then put the food in the fridge and headed off home for her own lunch with Steve. During lunch another friend rang. After lunch Lyn did some cleaning, hoovering the carpets and watching the television at the same time – Steve had it on to watch the football. Time for the beautician's trip and so Lyn headed off in the car phoning her sister Sue again on the way. Lyn wandered round the shops for a while before going to the beautician's house for a manicure. Returning home the traffic was bad again and so she called Steve to let him know and texted a friend – some of her friends preferred to text and so she went along with this.

The traffic was terrible and she was late collecting the children, which meant less time to catch up and chat with her friends who had had the boys all day. She got there eventually - apparently they had been watching the Arsenal match, playing with their gameboys and later playing in the park. At times Brian had been bored and so had texted his friends. He had also used the wap facility to check the half-time scores when in the park. Brian always used all his free minutes and his 50 free text messages per month. He sent many messages earlier in the month and had to slow down towards the end of the month, checking in to see if he had reached his limit. If he goes abroad on holiday with the school or relatives Lyn always puts some extra on his phone so he can always text her – it costs him 40p per text when out of the country.

It was another half hour to get home and they stopped for petrol and a lottery ticket on the way and at McDonalds for a take-away. The radio was on in the car and the boys ate their burgers, finishing them off in front of the telly watching Pop Idol. In the car Brian had texted a few friends to pass the time – he was often bored in car journeys.

Having spent more time than planned in traffic Lyn was behind so she disappeared up to her bedroom and switched on the TV so she could keep up with Pop Idol in the background. But she did not have time to sit and watch it. She had to talk to Sue again and her Mum. Lyn phoned them both. Then a friend her on her mobile – while some friends phoned her landline, others always phoned her mobile. After this Lyn phoned Becky, her other sister. She put the phone down and had a bath. She got dressed for the evening out; her husband came to chat about his day. At 8.30pm she and her husband bid the boys farewell and went out in the car, going first to a restaurant they had arranged to meet up at and later to a night club until the early hours – she had her mobile with her but she did not use it at all. They had a great time, although they didn't get home until 2am. The next day she texted her friend to say thank you.

Lyn's communications

Lyn had got her first phone 10 years ago, when most people did not have one. She had wanted to keep in touch with her children because she was going out quite a good deal. Her pattern of mobile use had not changed very much over the years, apart from texting now. And now other friends had mobiles she would make more mobile-to-mobile calls. She expected to send pictures once other people she knew acquired camera phones.

The grandmother, Lena, had had a mobile for 3 years, so she was one of the earliest amongst her peers to get one, although now a few of her friends also have them. But she still kept the same device, rather than upgrading each year – which Lyn could not understand, since she herself upgraded every year to get more features. Lena had got the phone when a telemarketing firm had rung her trying to sell mobiles – the grandfather had wanted Lena to have one in order to keep in touch with her.

Brian's communications

Brian, 11, got the Wap phone in August 2003, so he had not had it for very long. Most of the time he said he just 'played' on it, since he had 250 free wap minutes a month. But Lyn was a little critical of how useful the WAP facility was:

Lyn: 'You can't find out about much on your phone. We've got broadband. So it's easier...if you want to know anything. And it's a bigger screen so you can see better...rather than your...mobile'

Brian had a T-mobile tariff with free evening and weekend calls to other T-mobile users - some of his friends were with this operator. On his tariff the free off-peak times started at 6pm, whereas Lyn's started at 7pm. Therefore she sometimes used his mobile if she had to make a call between those times.

Brian's parents did not allow him to use the voice mobile in peak times because it was too expensive. If he needed to make contact with his mother he had to text her. If he just texted the word 'Brian' to his mother Sara would then phone him back from her mobile.

The camera phone

The Davidsons got their first camera phone in December 2002. It was partly useful for Steve's work. He worked for a business selling blinds, and he could take photos of the space where the blinds would go when out of the office. The Davidsons had used the phone once to take a picture of Lyn's car that they wanted to sell. They then transferred the image to the computer and downloaded the image to Loot magazine. It

was quicker than using a digital camera and the small size of the picture was fine for Loot.

The Davidsons had used the picture phone on outings and holidays. Brian was keen on this and had transferred the images to his computer – for instance, a picture of Villa Park grounds when he was there watching a football match. Brian was the only one to go back and look at the pictures that they had taken. The Davidsons did not send images to anyone because they did not know anyone else with a camera phone. Partly since Brian was so keen on the camera, the family had ordered an additional camera attachment that they could clip on to either of the other mobiles, and so they would have two camera phones in the family.

Case study 2: The Miller family

Sharon is 39, married to Mike and they have two daughters, the older one Becky the younger one Charlotte. George is Sharon's father-in-law. The focus in this case study is on Sharon and Becky.

The day of the diary

Becky woke up at 6.30, got dressed and made herself some breakfast before going into her parents bedroom to have a quick word with Sharon at 7 O'clock. Then Sharon got up and made breakfast for herself and Charlotte. Mike drove Becky to the bus stop at 7.30 and at 8 she caught the bus to school, in order to start lessons at 8.30.

At 8 Sharon received a call on the home phone from a friend. Most of her friends are in a similar situation with children being given lifts to school or to the station in the morning. So if they needed to make contact with each other it was usually before 8.30 on the landline. Sharon then took Charlotte to her local school and returned to tidy up the house, also making two phone calls to the mobiles phones of friends. At 10 she went to the gym, and had a chat with her friends there before the keep fit class. At the end of the session, while chatting to the others in the changing room she received two text messages, replying to one of them.

As planned she met up with some other friends for leisurely lunch starting at mid-day. Just before eating she used her mobile to phone two other friends, and towards the end of the meal she received a text message from her husband, to which she replied. At 2.30 Sharon drove home, and then started to think about preparing supper.

Meanwhile, Becky finished school at 2.30 and made her way homewards via bus and train with her friends. She called her mum on the mobile to let her know she was going with her friends to the

shopping centre first. During cooking Sharon called a friend from the home phone and received a call. When Becky arrived home from school at 4.00 Sharon made some tea for her. Becky ate it while watching TV. In the meantime Sharon went off to collect Charlotte from her friend's house, having a brief chat with the mother while she was there. On returning home at 5.00, Sharon watched TV in the living room for an hour on her own before returning to her cooking. Becky retired to her bedroom and did her homework, some of which involved word-processing on the PC. Just before supper, a friend called Becky on the phone in her bedroom.

Supper was ready to serve by 6.30, by which time Mike has returned home from work. They all ate together in the kitchen. During dinner the phone rang twice. Sharon let the message go to the answering machine. She sometimes did this because she did not want them to be disturbed *'otherwise you're answering the phone all the time during dinner'*. Besides, she could hear the message to decide if it was urgent and whether she needed to pick up. In fact, the calls were for Becky – her friends had tried the phoneline going to Becky's room and when that did not work they tried the home phone. Many of the evening calls to the home were for Becky.

Sharon: *'Normally between 6 and 7 the phone definitely starts going...and it can be constant until 9 o'clock'*.

So after dinner Becky called her friend back from the main phone in the living room, and then got a call there from another friend.

Supper was cleared away by 8, when Sharon started to make the first of four more calls to friends, two of which were replies to earlier calls. Then the whole family settled down to watch TV for the evening. While watching, Becky sent three text messages to friends and received two. Becky went to her bedroom at 9, read for half an hour and then went to sleep. The parents went to bed at 10.

Sharon's communications

The household first had a mobile when Mike got one since he worked in an outdoor market and so it was useful for work. Sharon first got a mobile about 7 years ago, when they were first becoming popular *'and everyone was starting to get one'*.

Sharon: *'We thought it would be able quite nice to be....in a situation when there was an emergency...to be able to use it...if you needed to'*.

She had started off with 'pay as you go', but then moved to a contract because it was more economical given the amount she was spending. She went on to a fixed tariff so that she knew how much she was going to spend and this also had had about 20 free minutes of calls. Since Sharon was also going over this limit as well she changed tariff and

now had 200 free minutes of calls (that can be used at anytime) and 50 free texts a month. These roll over to the next month if she did not use them. But she thought that having the free minutes had encouraged her to make more calls, and this was also true of her friends

Sharon: *'It's just so easy to keep in contact, so convenient...you get to a stage when you couldn't do without it...I'd feel really, really lost without my phone now'*.

She sometimes checked to see if she was nearing her limit as regards calls, but Sharon was disappointed that she could not check how many free texts she had left. It did not matter that much because she would only ever go over by a 7 or 10, which was not too expensive, only £1.

The free calls had changed her pattern of communication. Because she had them she tried to use them up, and simply made more calls nowadays. Her friends probably did the same. Also, she used to make even more calls in the evenings, and did not mind doing so *'but I really don't like it now'* and so she only rang the ones back that she had to ring. Since she was tired then she preferred not to be bothered doing this, she wanted to *'sit down and watch the TV and relax a bit'*. She would make free calls on the mobile during the day instead – *'in the day I don't mind it so much, somehow'*. For example, she had a hands free system in the car and would phone while driving, thinking of who she had to contact next, or ring back, or phone to see how they were. She had always been good at maintaining contact with her social networks, but now she was even better.

Family and friends usually called her landline first on the days when she was not working since they knew her routines. If it was a work morning they might try to mobile first. It was complicated because she was out a good deal anyway (e.g. mornings at the gym) and if people knew this they might once again try the mobile first. She had a message on the answering machine attached to the landline giving her mobile number and that of her husband.

Some of her calls from home were made with the mobile because of the free minutes on the phone (usable at any time) – so during the week in the daytime she tended to use the mobile because it was cheaper. But some were from the landline, even before 6pm, because she sometimes forgot about the mobile and reached automatically for the home phone. The day of the diary was a fairly typical one for communications on non-work days. She worked 9-2 on Mondays, Tuesdays and Thursdays and so tried not to make calls then. She was willing to receive urgent calls at work, but tried to discourage calls in general. However, she did read her hotmail emails at work, and tended not to bother when she was at home. Her friends were also on e-mail, *'but it wouldn't be the kind of instant thing that a text or a phone call would.'* Overall, the day of the diary was fairly typical for a non-workday in terms of the overall number of communications.

During the day Sharon sent some texts. She had started texting a couple of years ago when she was shown how to do it. Sharon: *'I thought this is good...I like this.'* Her friends also texted. She thought that some texting was useful if there was a short communication to convey. But if this was going to lead to several texts back and forth Sharon would probably choose to phone using the mobile instead because it would work out quicker.

Sharon left the mobile switched on much of the time, turning it off at night when she recharged it. Occasionally she turned it off in the evening. She was wary of letting the battery go to low, and also had a charging facility in the car and one of her colleagues had a charger at work. If there was an area where she was not allowed to use the phone, she would put it on silent.

Becky's communications

Becky, 13, had had a mobile for about two years when she started attending secondary school. The journey involved a good deal of travelling including train and bus and so for the first year they had arranged for her to ring on the mobile or text to say that she had arrived safely at school. And then she could ring again when on her way home to arrange to be picked up.

Like other school students Becky are not supposed to use them at school. The children not even supposed to have mobiles with them, actually, but they do. But sometimes she or the other girls would text from the toilets if they had to send a message urgently. Becky no longer has to phone when arriving at school. She usually turns it on when on the way home. The children had to be picked up from the tube and so the parents had a rota. Once a week she would phone Sharon to say when she was going to arrive at Edgware so that she could be picked up.

Sharon: *Really her essential calls are once a week...sometimes at weekends if she goes somewhere I say to her "call when you get there...or text me"...but most of hers are social ...*

Becky's mobile is on a contract whereby her parents only pay for calls and texts and she has no free minutes or texts. They have a rule that she should not go above £10 a month.

Sharon: *But if she goes over that I'm really not happy...up to 10..really it should be a lot less than that because there really isn't any...real need for her to actually make any calls...the odd texting isn't going to amount to a lot'*

However, the parents clearly tried to discourage too much texting. The tariffs for the two landlines were such that they were free in the

evening. Hence Sharon commented that Becky and her sister were encouraged to restrict their communications to the landline after 6pm. That said, the diary clearly showed that a few texts were sent and received on the Friday evening of the diary, and Becky said this was normal. Becky had been texting since she first got the phone, and her friends at school all knew how to text.

Becky's had her own fixed line in her room that was used for both calls and for going on-line. She also regularly had sessions online using MSN with her friends, when up to 20 of them might be online at the same time. Compared to e-mails it was instant. Sharon left her mobile on in the evening until she went to bed (in case she got any texts). Sometimes she forgot to charge it up and the battery ran down. *'We often have panic situations'*.

In the evening of the diary Becky used the computer for word-processing homework. Sometimes she searches for things on-line using Google if she has a project. She sometimes sent e-mails.

George's communication

George, 69 and Sharon's father-in-law, did not make or receive as many calls as Sharon and Becky. When he was home he used the landline. But he also worked in an open market and so like his son he had acquired a mobile early for his job, to be contacted and also to order – he had acquired it at least 8 years ago. He left it switched on when at work. He knew how to receive texts, but could not text himself. On the day of the diary he made one call from his mobile phone to his son at lunchtime and a few calls from the landline in the evening.

Camera phone

Sharon had acquired the camera phone 3 months earlier when she had the option of a yearly upgrade and her operator was offering it for another £20. She thought it might be a gimmick but decided to get it anyway. She did not think much of the quality of the image when she first tried it out, and decided that *'it was a real gimmick and I don't think it's actually worth it.... I'm not that impressed with it... (...) I can't think what I'd need it for.'* In fact, she had dropped it and phone was currently being mended.

Case study 3: The Lenny Family

Janet, 37, is married to Nick, with two daughters; the eldest is Jenny the youngest is Melanie. Maggie is Nick's mother. The main focus in this case study is on Janet and Jenny.

The day of the diary

Janet woke up at 7 when the alarm radio came on, got dressed and assembled her things for the gym. Shortly afterwards Jenny and Melanie got up and joined their mum for breakfast while watching TV. Janet did not usually make calls early in the morning unless she needs to because she did not like talking to anyone then. Just before 8 Janet left home to drive the girls to school. After returning home at 9, she tidied up, had breakfast and received a call from her mum – which was common. Usually her mother would call the landline first, and then try the mobile.

'And sometimes she'll try the mobile before I've got to the phone here!'

The gym session lasted from 9.30 to 10.30. On her way driving to the post office she got a call on her mobile from a friend. The friend usually tried the mobile first. They were on the same network so the calls were free, and hence Janet also tended to call her on the mobile.

Also *'during the day she might have figured that I wouldn't be in'*

Once at home, Janet had a shower, called her mum's home phone and then called the travel agent about their holidays. Janet had recently realised that the new One-Tel flat rate tariff did not include certain numbers 0845 and 0870 – it was 8p a minute to ring 0870

'Lots of companies are like that now...helplines...all sorts of things...and you can be hanging on...I rang Virgin holidays and it was like 45 minutes! But I knew ...and so I rang Virgin Atlantic and said "Have I rung the right one...Oh, could you put me through to the holidays"...so I didn't mind hanging on for 45 minutes because it was included (in the OneTel package).'

At about midday she went to check her e-mails. The Lennys had always-on broadband, and so Janet would occasionally look in the study to see if she had any e-mails. That day she had an e-mail a friend in Hong Kong, a reply to one Janet had sent the evening before. Janet sometimes checked late at night as well because they were on a different time-zone.

Jenny sent Janet a text message during the lunch break at school. Then Janet went to do some quick shopping in Tesco's where she received a call on her mobile from Nick – since work paid for the call he did not mind calling from the workphone. But he would also ring from his

mobile sometimes if he was out at lunch time – being on the same network the call was free.

‘Or he’ll ring me from the shop – “What have I got to get?”’

Janet returned home to have lunch while reading the newspaper and listening to the radio. After lunch, Janet took the car to go to the Debenhams sale, where she spent the afternoon until it was time to pick up the children from school. Maggie called her on the mobile to say that she was at Tescos and she thought she has left her car keys in the car - and was locked out of the car. Janet explained that she could come and pick her up but only after she had picked up the girls because they were waiting for her at their respective schools. Maggie agreed, but said that she would use the time to check if she had left the keys in Tescos. Janet used her mobile to call Nick at work and explain what was happening. Maggie phoned Janet from her mobile to say that she still had not found the keys, and she phoned home to her husband to let him know what was happening

First Janet picked up Jenny at 4, and then went on to get Melanie. For some reason she could not get through to Maggie’s mobile from her own mobile to say they were on the way. She asked Jenny to try on her mobile – also without success. Eventually, she picked up Maggie up at Tescos, Janet dropped the children off at home, and then took Maggie home to get some spare car keys before driving her back to Tescos.

When she finally got home at 5.00, Janet made some tea for herself and her daughters, and talked to them with the TV on in the background. Jenny then started her 2 hours of homework, using the PC, calling three friends on her mobile during that time. Some of this was because she was stuck on something doing her homework. But some of the calls were for social reasons, in which case she preferred to talk rather than text.

‘I can’t be bothered to text in the evening’

Jenny had used her mobile because:

‘Mum was busy on (on the landline) and she chats for ages.’

Janet: *‘And she’s got loads of minutes on her phone...so...she can...she can use the housephone if it’s free, but if not she can use that one’*

Meanwhile Janet started the evening meal and packed up the next day’s lunches for the children, while listening to the radio. She phoned Nick once again at work, noting that she would quite often ring him several times in the day – it could be 5 times a day.

““What time will you be home”, or “what do you want for dinner”, or” I’m going to be late” ...that kind of thing’.

She also received a call on the home phone from a friend.

Before dinner, Jenny was doing her homework, partly in the lounge, partly in her bedroom. At one point Janet helped her by going on the Internet to look up something. At 7 the whole family settled down for dinner in the lounge while watching Eastenders on TV. Jenny then had her bath, and watched some more TV during which time she received a call on her mobile from a friend. At 9.00 she went online for a while to check for instant messages and emails. Instant chat on MSN was not prearranged with others, but there was usually someone online whom she knew, either from her current school or her previous one. Jenny then read a magazine and watched some TV in her bedroom until going to sleep at 10.30.

Janet cleared up at about 8, and phoned a friend. Then it was time for ironing and a bath – during which time a friend phoned on the home phone, and she received a text message from another friend – to which she replied.

Janet: 'I can be on the phone all night...sometimes the phone doesn't stop ringing...and sometimes if there's something good on TV that I want to watch I'll make my calls earlier...I often speak to friends up to about 10.00, 10.30. I won't use my mobile in the evening, but a friend sent me a text and I heard it in my bag so I sent one back.'

Janet then set up the dishwasher and washing machine before making one last call to a friend at 10. At 10.30 she and Nick went to bed.

Janet's communications

Janet, 37, first got her mobile 6 years ago:

"I suppose at the time it was like...the thing to get."

Everyone was getting them and the prices were beginning to drop.

"It was an affordable thing...I can't imagine not having one now...like I was out the other day and I had a phone call to say Sophie had hurt herself in netball, had sprained her ankle and I had to go and pick her up.... if I hadn't have had that mobile I wouldn't have known...they couldn't have got me until 3 o'clock...now I know that 30 years ago when I was at school they would have had to have waited until my mum picked me up...if you weren't at home what would they do? I suppose they'd have just managed till you got there...but that way I was able to get there quicker and earlier"

Nick already had one. In fact, years ago he was on One-to-One. He did not make many calls during the day but there were free calls in the evenings and at the weekend. So Janet used to wait for him to come

home and make all her calls on his phone then and at the weekend. She could be on his phone for hours.

However, as tariffs changed, Nick pointed out that his was not such a good one to be on because of the expensive day calls - compared to the other deals on offer. They moved to the On-Tel offer for the landline a few months ago. For a flat rate (£13.99) Janet could make any calls in the UK at any time. This had made a difference to her pattern of calling - for example, she has a friend in Manchester who she used to call occasionally in the evenings, because she was conscious about making calls after 6pm - but now Janet would call her anytime if she felt like it and the same is true for calling all her other friends.

Janet: "I love it because we're not restricted."

Hence she used the house phone more now. Janet had been texting for a couple of years.

Janet: 'I think I started to get text and I thought "I've got to send them back"...I know how to do it...although I'm still not sure how to get capitals...but I can manage, I get by'.

Since she has free texts, she sometimes texted friends on their mobile rather than call – which would be expensive. Janet also used her mobile phone more nowadays

"I noticed when the bill came yesterday that I'd used all my minutes up plus extra from last month...so I'm obviously using it more...I don't really ring for a chat...just a couple of friends."

Later Janet commented on her husband's decision to phone the mobile.

Janet: 'One thing I don't like is when my husband tries the house phone and it's engaged...so he knows I'm on the phone...and he'll ring the mobile...by the time I get to it it's stopped...he often does that...it's really annoying.'

Janet was on a different tariff to her husband and daughter. They were on *cross-network*, which meant that they could ring any mobile with free minutes. Janet could ring people on the same network for free, but it cost to ring other networks, such as her sister on T-mobile.

Janet: 'So I'm a bit mean at the moment and I won't ring her on the mobile unless I have to...(...) I mean I will...I need to change my tariff to cross-network ...and then I would ring more people from my mobile...for instance, it quite dear to ring my sister on my mobile...it's expensive to ring from One-Tel to a mobile now...but out of choice I would use my housephone...instead of using my mobile...but if Jenny's here, she rarely uses her phone...I'll say I'm using your phone''

Commenting on whether having the mobile had affected her routines:

Janet: *'Sometimes it infringes on you privacy...I mean you want to be left alone and unless you switch the thing off...I mean, my husband "Where are you, what are you doing"... "Oh, leave me alone, don't drive me mad"...I hate that feeling of someone...you know "What are you doing, who can I hear in the background"...that kind of thing...but then there are certain times when it can be invaluable...like I broke down in the car a couple months ago and I had to ring the AA...where are there any phone boxes...you've got to walk miles sometimes...so...'*

In fact, she rarely switched it off, but she switched it to silent sometimes she knew she was now allowed to use the mobile, as in a hospital.

Janet *'You can't have it ringing...it rude...so I put it on to silent.'*

Interviewer: *'Although in some places they don't like you having it switched on at all because it affects the equipment.'*

Jenny: *'It's supposed to be turned off'*

Janet: *'Yes it probably was meant to be turned off, but I didn't know so I put it on silent.'*

Janet had had a handsfree and charger kit installed in the car (£180). So she charged it there rather than at home, and left the mobile on at night in her bag – if she heard any calls in the evening she could answer them. She had a couple of friends who would text her in the evening if they couldn't get through on the phone. Sometimes she heard it, sometimes she did not.

She now found it easier to make and receive calls in the car, especially given the times when she was driving the children around. Before, she would not hold the mobile while driving, but now if someone phoned her she could chat. So she probably used the mobile more in the car since getting this kit, about a year ago.

'I find that brilliant.'

The problem was that she wanted to change her phone to be on the same tariff as her husband and Jenny so that she could call them for free. But any new phone would not fit the handset, and so they would have to change this – which was expensive. Nick was advocating that they wait another year until they changed the car, and then change the handsfree, mobile and operator all at the same time.

Right at the end of the interview they made some comments that showed how telecoms bills were an issue in the household, and hence

why some of the strategies noted at various points were actually attempts to address a problem.

Janet: *'But my husband said "Oh!" ...he can check (the bill) on the computer...I said to him that unless you change my tariff obviously if I have to make a call...I did I rang my sister twice last week on her mobile...and I looked and it was like 40p a time...so he's not going to change my network... I've got to use it.. "So (pretending to talk to her husband) don't whinge at me about making the odd call" ...and I have cut down...and when I'm out an about the children do not ring me as much on my mobile...they do if they have to....but sometimes I'm out shopping and they used to ring me 5 times...'*

Jenny: *'I would ring daddy to ring you.'*

Janet: *'She wouldn't ring unless it was important...which quite often they did do ...and he would say "Oh my god, they rang your mobile 90 times last month when you were out ...for goodness sake...stop, it cut it down"....so we are trying to cut down.'*

Jenny's communications

All the other children at school had mobiles. Janet explained how Jenny, 13, had got a mobile:

Janet: *'Well she stole the one the one that was my husband's old one, a pay-as-you go phone and started to use it...and he gave it to her...and then ..I suppose it's just peer pressure...so we bought her one for her birthday last year...and of course this year it was out of date and not good enough...not up to date enough and she had to have a newer and more modern one...it wasn't trendy any more and it wasn't fashionable....so, of course my husband caved in again...and bought her another one...but I don't really feel she uses it to its full capacity...you've got 200 minutes on it...she doesn't really use at much as she could do.'*

Jenny protested: *'Yes I do.'*

Janet: *'No you don't. I know friends' kids that send 20 or 30 texts a day. You're not doing anything in that kind of league. So she's quite sensible...bit mean with it.'*

They bought Jenny the new one in August for her birthday – this was the one that came with the camera attachment (rather than being built into the phone). She had wanted that model because it was the same as her father's (although he did not have the camera attachment).

The schoolchildren were not allowed to use the mobile at school. But like the others, if she wanted to text her mum she would go in the toilets and do it, for example, to say she might be home earlier, or could

she stay on for something like netball, or if there was some other change of plans.

'Or did you buy me the right magazine in Tescos!' (laughs)

All her friends at school could text. On the day of the diary Jenny phoned her mum on the mobile when her mother was late picking her up.

Janet: *'I'm coming, I'm on my way....sometimes calls are a complete waste of time really...I'm coming...you know...that's not important...'*

In part this was because calls were now free as the daughter had just switched onto the same network, Vodafone, whereas it used to be '60p or whatever' to ring. Janet was no less conscious about the cost of calls because of this.

Although Jenny sent texts – as all her peers did – she was not a heavy user. Janet pointed out that she normally had quite a number free texts left at the end of the month. Jenny would check to see if she had any texts when she first arrived at school in the morning. She usually switched her mobile off overnight. Sometimes it was also switched off for part of the evening, and then she would occasionally switch it on to check for texts. As regards games on the mobile:

Jenny: *'It's only got chess on it and I haven't figured out how to play it yet...I used to have snake ad I used to have that (on the old phone)'*

Judith's communications

Both grandparents had mobiles but they only used them for practical purposes when they were out and needed to arrange something – they did not use them for social calls.

Janet: *'She doesn't use it for chat. I think when you're like that...I mean my mum's like that...they only use the mobile if they need to use the mobile if they're out. They wouldn't ring for a chat. It would be because they want something. Whereas I rang a friend who I had spoken to the day before so we'd chat for a couple of minutes. It wasn't for anything in particular.'*

Judith also gets calls on the mobile when she is out, especially from Janet's sister-in-law. Not many friends call her socially on the mobile. On the day of the diary Judith had been up checking her emails very early – she has some friends abroad that she keeps in touch with. She makes quite a few calls during the day and evening to friends. She can be on the phone for long periods.

Janet: *"She's always on the phone. Whenever you try to ring her it's engaged. They've got that awful call-waiting which they don't pick up...which is even worse"*

Sometimes if Janet needed to call her, she would ring her father-in-law's mobile (with the same operator as Janet) and ask him to put Judith on.

Janet *"I would be desperate to call her mobile because she's not on the same network as me. And sometimes the phone is in her bag...and she doesn't hear it"*

Some of Judith's evening calls were from the kitchen because she had a cordless phone.

Camera phone

Jenny had not used the camera much.

Jenny: *"The pictures are not that good quality...they're very dark."*

Janet: *"It's like an accessory, it's not built into the phone...so it's something you've got to remember to have with you really...she keeps it at home...bit of a 5 minute wonder if you ask me."*

When asked about taking it away on holiday:

Janet: *"Yeah she might do...yeah it could be useful to have...if we're going away on holiday we take the proper camera...but I'm sure it will have it's uses...they just threw it in as part of the package."*

A few of Jenny's friends had camera phone.

Jenny: *"My friend did send a picture to me but it didn't work."*

Janet: *"I still think it's in the early stages, this type of thing..."*

LH: *"Didn't you start experimenting with it when you first got it?"*

Janet (commenting on her husband) *"Well, I think he started looking...well, it's in her room...but there's never enough time...yes, he probably would sit and play with it if he found it, got it out of her cupboard...he probably would fiddle around with it."*

Business Teams - Case Studies

Case Study 1: The Local Government Manager and his team

Simon works in local government offices. He is an avid user of technology and is writing the IT strategy for the department. He leads a group of 5 and in common with the other 60 people in the department he is on the road for about 50% of his time. The offices are set up as shared 'hot desks' but people have tended to adopt a routine of either coming in to sit at the same desk everyday or working from home and only occasionally coming in. There are at least 2 people allocated to each desk, the fixed phone system and the PC's are password operated. Simon and his team have a mobile phone supplied by their employer who has recently banned their use when driving cars. Their cars serve as an office when out on the road and this change in policy (brought about by proposed (UK) legislation for December 2003) is causing a lot of problems. They will only be able to use their phones in their company cars if they have proprietary hands free kit installed at their expense – currently dashboard cradles are provided by the employer but these are being removed. Simon is on emergency call out for which he has a pager and he uses a laptop for home working, a Dictaphone for letters that his administrator types (he cannot type accurately or fast). He doesn't have a PDA although is excited that they will be trialling Blackberry's soon – he uses an A4 diary for all appointments, records of meetings and for phone numbers and addresses.

The day of the shadowing

Simon's day starts early – he can work flexible hours and so he comes into the office at 7.30 to beat the traffic and have some peace and quiet so he can get on with his paperwork. He has to maintain records about his work on two databases as well as recording how he spends his own time. His records are used from time to time in court for legal proceedings and thus must be accurate and withstand scrutiny at any time. Simon has been in his job for 8 years but he is looking for a change – his colleagues know this. Today is a particularly busy day, a Friday, he has quite a lot of paperwork to catch up on and so he had booked the conference room to read up on files and dictate some letters. Although much of his work is on the PC, plans and letters from clients are on file and these must be checked against the computer database and his personal notes in his diary. He would be lost without his diary – his 'bible'. It not only has appointments and records of meetings but it is an industry diary and contains all the phone numbers of the other

authorities he must deal with. The supplier of the diary does not offer this information on a CD or web site and the diary is the only place that has it all together.

Sat at the table in the conference room he muses over the quiet and then realises he has forgotten to ask his assistant something. He gets up and tries to use the phone in the room to make an internal call (she is about 15 yards away). The fixed phone won't work as he has already used his password to activate the phone on the desk he is working at and he realises he can't activate more than one phone with the same password at the same time. He gives up and rather than disturb his train of thought he phones his assistant on his mobile – he jokes with her before getting the data he needs. He has to make a couple of calls to clients to clarify the data – one number he rings refers him to a client's mobile and he calls him on that. He is still using his mobile due to the problem with the password. His wife rings him on his mobile to see if he has had the car valeted yet – the road is closed this morning to the car wash so he says he'll do it on the way home.

Simon *"My wife likes to call me on the mobile - she'd be lost if I didn't have it, and she uses hers all the time."*

He only uses his mobile for work

Simon *"as soon as I get home it goes into the briefcase and that's it until Monday. The pager will alert me if I need to be contacted in an emergency"*.

He returns to his desk where his colleagues are discussing the role of the PC in their work.

Simon's colleague *"The trouble with these PCs is that they are a good way of looking like you are doing something when you are not actually doing your job."*

Most of the things Simon and his team use their PC's for are record keeping. This is additional to the jobs they have been doing in the same way since before they had the systems they now use. They agree that they are in the office much more now than before they had all these IT systems and so don't get around so many of their clients. They talk about using cameras – they quite often use them for their work and for some a camera phone might be useful but they believe that they cannot justify it at the moment. May be these things could be discussed at the team meeting next week. Simon calls up the intranet to see if there is any news he should include in the meeting and to see details of training requirements. He sees that there is a new member of staff in another team and he reads up about her checking out her photo.

Simon has eaten his sandwiches as he was working but he goes up to the snack bar with a colleague. While he is there he spots the new team member he was just looking at on the intranet and introduces himself.

Back at his desk he makes more calls from his fixed phone and receives some calls on his mobile – they are all from clients he knows. He struggles to find an address for the place he is about to visit because he is looking for the address in the way it is written in his diary and not in the way it is on the database. His colleague comes and helps him out and another comes across to have a look at what he is doing not understanding what the problem is. Neither of them can help him and he is left on his own to sort it out.

Another member of his team turns up and is teased for his appearance on a Friday afternoon. He has come in for a chat and to pick up some papers but doesn't use a PC while he is there. Although Simon is the team leader the focal point of contact on the team is their administrator Simon asks her for data or assistance with most new cases and at the same time she is taking calls on her fixed line from others on the team, and from the general public.

After checking that both individually passworded databases are updated Simon signs off and heads out to an appointment with a client after which he'll get the car cleaned and probably spend an evening at the cricket club.

Case Study 2: The Market Research Company

Four people from a small business with two other employees, who were out of the office, were shadowed for a morning. The company delivers specialist market research reports to a range of industries and the people shadowed were involved in all aspects of the company's work from administration to conducting, managing and selling the research itself.

The Day of the Shadowing

Tom and Stephen were out of the office. Nigel and John were planning a sales drive for their next project and Clare was sorting out arrangements for a conference associated with one of her projects. Stuart was organising meetings for Nigel, taking occasional orders for publications and sorting out documents and emails on his PC. During the morning when these people were shadowed they made and received very few phone calls, none on their mobile phones. They all worked at their PC's or, were talking with each other informally or, as was the case with Nigel and John having a planning meeting in Nigel's office.

The office layout was open plan with one extra desk; Tom used this instead of his office. Tom is the lead user of mobile ICT and the wi-fi

base station and shared laptops were purchased at his suggestion. Tom's office was so full of papers that he could not use it because he couldn't reach his desk. He won't let anyone touch the paperwork because he has told them he knows where everything is and can grab it when he comes in, which is rarely.

In addition to the three offices there was a conference room that had only chairs, conference table and a flip chart in it.

Stuart's Communications

Stuart is the team administrator and is the front office for their publications. People can buy them over the phone and he has two payment machines for these transactions – one for each of the marketing agencies involved; they are separate companies hence the two machines.

Stuart had a mobile phone on his desk but he doesn't use it for work and he isn't an avid user. It was an old model.

Stuart "I don't really use it. I am based in the office - an office manager does not need to use a mobile very much. In fact it very rarely rings and I occasionally send and receive texts. "

"It's just on my desk to be charged up. 90% of the time I use a landline. My friends sometimes leave messages but I usually phone on a direct line and get through or talk to friends and people in the office face to face"

Stuart provides general office support to the five other people in the company and acts as personal assistant to Nigel. Nigel is the salesman and he relies heavily on Stuart to keep his diary in order and provide him with administrative support. Nigel doesn't have a mobile phone and this occasionally causes problems if Stuart or someone else needs to contact him when he is on the road visiting prospective clients.

Stuart has a PC on his desk – he has linked up to a web site that automatically downloads different screensavers on a regular basis.

Stuart "I've got the PC to process orders, keep the catalogue up to date, handle the email and manage the data on the business's web site"

Stuart "Some days I'll do general office management maintaining the database and contact details and other days I'll do a lot of interacting"

Stuart explains that over the last two years there have been changes in the office system with web site and internal systems being updated but although they had acquired new PC's they had kept the printers, fax machines and photocopiers.

John's communications

John writes market research reports and travels quite a lot to the Far East and Central Europe. His desk is very tidy. His mobile phone (his own not the business's) is on his desk – he left it there, switched on, while he went to a long meeting across the office (but out of earshot) with Nigel. He has a PC and a Palm PDA. His mobile phone charger has a photo of his wife and daughter beside it. He will borrow the office laptop for presentations but doesn't bother to use the mobile phone when abroad because he visits countries that have incompatible networks and he has come to rely on phone cards or the fixed phones in offices and hotels. He likes mobile phones and finds them useful.

His wife bought him the PDA as a present and he has really taken to it, synchronising it with his PC and keeping his appointments on it - even though he thought he wouldn't use it that much when he got it.

John “ *I use it for my agendas, to keep my network of business contacts. I can reach these at the press of a button. I've got my e-mails on there*”

“The PDA picks up everything in inbox. I've more than 1,000 read e-mails that I store on my PC. I use the download to my PDA to manage and read mail.”

Talking about using the PDA to prepare emails for sending when back in the office John says:

John “*When I am on the tube I use it to write up notes. I usually write rather than using keyboard. The keyboard is not very usable with the stylus. I touch type and I find using the PDA keyboard with the stylus difficult. I thought about having two stylus one for each hand but decided against it*”

John finds the PDA particularly useful for taking abroad because of the appointments and data stored on it. He did once consider an all in one PDA/Mobile Phone device but decided it wasn't practical.

John and Nigel use video and tele- conferences for their work including making presentations. He prefers the videoconference as you can see the body language. With some of the networking teleconferences they do they don't know how many people are logged on and can get no idea of the response to their presentations.

John has had a PC since the end of the 1980's. He tries to do as much as possible on it and to minimize the amount of paper he uses. His reports range from thirty to several hundred pages so sometimes paper copy is necessary for proof reading or to discuss or edit.

John only works with Nigel – John writes the reports and Nigel sells them.

John “75% of the time we are in the office together. We will speak every day though, even when I am abroad. If I am on a trip to the Far East we agree a particular time of day to speak and we speak on a weekly basis. If something has happened in office or there is some other incident we will phone each other in the evening to touch base”

John explained what media he uses to update his research.

“ The client may need updating so I will phone a colleague and ask for information - usually by phone but sometimes by e-mail.”

He borrows the office laptop for business trips – it is a bit old fashioned but it does the job. He hasn't used wi-fi yet.

When he is working at his desk he has many applications open on his PC at the same time. He doesn't use a paper diary preferring outlook and his PDA. However, he does print out his diary at the beginning of the week and updates the paper copy not the PDA. This is because it is quicker. John is very organized and plans his day using an excel spreadsheet table with his tasks.

When is abroad he leaves a back up copy of his appointments in the hotel incase he loses his PDA when he is out.

“This PDA let me down badly when it failed once and I lost everything. I keep a back up memory card now.”

John was quite happy with this backup procedure and was still continuing to use his PDA despite this disaster.

Of the various ICT John used he was most dependent on his PC and this was most important to his job. His GSM phone was useful in the UK but no good in Eastern Europe where he bought phone cards instead.

John *“ The mobile very convenient.”*

He said of his wife that having bought him the PDA he had discovered that she was adding notes on it, tasks for him to do or reminders for the weekend about places they were going or jobs to be done. He didn't mind this – in fact he quite liked the reminders within his work information and he smiled when he thought about it. His wife also liked him to have the mobile phone and only last week she had an accident at home and called him. She needed him at home to help with the baby while she sorted herself out – this was a really good example of how valuable the mobile phone had been as if he hadn't had it he would not have been contactable. Talking more about his mobile he

says *"I sometimes phone to ask my wife about a product in the supermarket. It's good to have the mobile"* and of his wife *"My wife usually calls the office but knows she can contact me on my mobile"*

"I increasingly give my mobile number now as a contact during the day – it's useful when I'm out of the office and there are occasions when it would be frustrating not to have it."

Clare's communications

Clare is office based and has meetings off site about once a week. She owns a mobile phone.

Clare *"I use my mobile phone for work to keep in touch with colleagues."*

Jane *"Is it a business phone?"*

Clare *"No a private one which I use for work occasionally to check on messages. It's useful if you are going to be late you can phone and say- Look, I'm going to be 10 minutes late, or for checking on colleagues and where they are - emergencies mainly. I use it to check if I want something ready for meeting - if you just want to come into the office to get something to phone ahead to check if it is ready"*.

Clare phones her work colleagues on their mobile phones when they are out of the office – especially Tom.

"He is out of the office a lot and uses his mobile like a landline and is always contactable. He is out of the office more than anyone else."

Clare explained that she does not like to be without her mobile and that one day she did leave it behind but

"It was a day when I came into the office so it did not matter that much. I left it behind. I don't like not having it here."

Clare does not like to give out her mobile number.

"I don't like to give out my number to too many people. You never know, you might be on holidays or something and you don't like your mobile number being used especially when you are abroad"

Clare explained that in the office and for work she is not dependent on the mobile phone and that she would only use it when she is out of the office or in an emergency.

"I wouldn't use it to discuss things. Only to speak to people who are late for meetings or someone who hasn't turned up".

Clare has a fixed phone, mobile phone, and a PC on her desk and explains that she doesn't have any need for a laptop.

Clare *"The two directors have laptops, but they are out of the office a lot. They are used for presentations etc. We have an office one we share"*

There is no use of Bluetooth but the shared laptop has got wireless LAN. Clare doesn't have a computer at home that is network linked to the office – Tom's laptop is and he works from home. She comments that she finds it easier look at e-mails in paper format rather than on screen.

Clare *"The laptop has got a little buffalo chip that networks picks up Wireless...um (Jane - WLAN or wi-fi?) Yes that's it. Tom is much more technologically knowledgeable about these things"*

There is a lot of paper in the office in cabinets, in boxes and folders on shelves and brochures on low tables in a reception area. Clare was asked how much of it is it a product of what she does or the research behind it.

Clare *"A lot of the paper work is brochures, reports, I like to get a feel for what I am going through. It's a lot easier to look at that in paper form. There are lots of daily e-mails to keep abreast of policies, evaluations as well as commission reports - e-mail alerts are invaluable"*.

Clare *"We get daily emails on policy, this one (showing it on screen) is one I get. There is a lot out there. There are some audit commission reports. Having email alerts like that is [on the PC] important for keeping abreast of what's happening in the industry"*

This would appear to highlight some tensions between getting alerts in the form of emails that are useful and having to deal with other material in email when Clare would prefer them to be on paper.

Clare explains about the problems of choosing the right media to communicate with prospective clients and people who are being invited to meetings. She is concerned to find the appropriate communications media and also to protect the email addresses. She doesn't send out emails with everyone's address still on it for example.

"I was arranging a partners meeting last Thursday, traditionally we send out an invitation by post with a fax back form, more recently we have been sending email reminders, emails are a lot quicker and emails are a lot more personal because they will e-mail back. It's a hard one this - letter or email... the letter is ...it's hard to know whether people will take it as a personal thing if it is an email - obviously it's a personal thing. I'm wary of sending to a large distribution list. It's not

good practice, and I do not send another person's e-mail address to others”.

Talking about the way she uses her phone with her friends highlighted different practices from those used at work. She texts more than talking and she'll usually text from work to set up arrangements to meet up.

Clare *“I will phone on my mobile when I get there”*

Clare has been on Orange for three years, she gets a lot of SPAM text trying to sell her a new tariff and dating services but she likes the tariff she has because she gets free minutes and text and although it means her phone is old (the SIM is not transferable) it doesn't matter because the tariff savings are worth it. She doesn't have a camera phone but a friend does – Clare can see there are benefits to having a camera phone. She compares the camera phone with the digital camera

Clare *“They do not have enough pixels. I'm looking into getting a digital camera because the cost of developing ordinary cameras is a problem. Camera phones are not the same quality -nowhere near a decent quality”*

Clare talks of about her girlfriend who has a camera phone. The fact she can't send any images to Clare doesn't give her a problem.

Clare *“She shows me the pictures she has taken when we meet up”.*

Nigel's Communications

Nigel is the Sales Manager and has his own office. It is tidy and contains a row of four drawer filing cabinets along one wall, a flip chart, and a desk on which there is a PC and a lot of pens and pencils, pencil sharpener and note paper. Nigel does not own a mobile phone.

Nigel *“ I don't own a mobile, never have and never will. I don't have children; my wife doesn't own a mobile phone. I am a Sales Manager – I make appointments to see people, I call them - they don't need to call me. On the rare occasion a person I am visiting is running late or can't make it then I reschedule when I get there”.*

Nigel is very clear about how he manages his work life and he uses Stuart a great deal to enable him to achieve his organisational goals. He will have Stuart in his office at the start of the week to tell him whom he needs to see and Stuart sets up the appointments for him.

Working closely with John he spent most of the morning of the shadowing in a planning meeting in his office.

Nigel acknowledged that he is seen as a bit of a maverick by his colleagues for not having a mobile phone but he just didn't need or want one in his life. He did not pass judgement on others who take the opposing view but was mystified by how much people were prepared to let the mobile phone intrude into their home life.

Nigel "I was trying to get hold of someone quite prestigious in a national organisation and when I rang his office I was given his mobile phone number to call. I checked if it would be OK to call on his mobile and was assured that it was. Imagine my surprise when I rang him to find he was on the beach on holiday in Cornwall! I felt really bad and apologised expecting to get short shrift and no chance of a business meeting if I called him again. But no, he was happy to talk to me and chatted about the proposition and we agreed a meeting time.

There's no way I'm getting a mobile phone if people like him think they can call me when I'm on holiday!"

In complete contrast to his partner John who was an enthusiast for his PC and PDA Nigel saw the PC, his occasional use of the laptop, and email as just part of the office tools. He kept a paper diary and paper copies of documents in filing cabinets (Stuart kept these up to date for him). He was horrified at the unsolicited email that they received every day and every time they thought they had improved the firewall it stopped for a few days and was then started again. (This was Tom's domain – Tom was the technology guru and he advised the company on these matters). Nigel's concern was about the content of these unwanted emails and was protective of others in the company who might be affected by the content.

Observations of the Multiple ICT

This office had a great deal of ICT equipment for its' 6 staff, 2 of whom were often not there. Three printers; 2 fax machines; 2 payment transaction machines; 8 networked PC's; wi-fi base station; a photocopier; fixed phones on all desks. 5 of the 6 employees had mobile phones but the 3 who had them who were shadowed used their personal mobiles for work. Each piece of the ICT equipment was used by at least one of them but not all of it was used by everyone.

In addition to the ICT papers, documents and large files and folders were filling every available space in the office that was not occupied by a desk or ICT equipment. There were archive boxes waiting to be stored, brochures produced for public consumption and in Tom's office stacks of paper on the desk, chair, floor, on shelves and on empty cabinets, making the desk and PC inaccessible. An empty box that had contained a wireless LAN card was lying discarded on the papers.

Explorers - Case Studies

Case Study 1: Andy and Alex – Making Music Movies

This section explores the lives of two men in their 30's who as well as having full-time jobs in different companies are partners in the making of music movies. They met at a multi-media festival called the 'Big Chill'⁶ and in common with other members of this community they are exploring new genres in music, media and image. They share the outcomes at events on line and by meeting up. One of the challenges of a successful group such as this is keeping it to a manageable number – already one subgroup have had a party that they didn't invite everyone to and this has caused some problems in the community. Alex and Andy met at an event they heard about on-line that was set up by the group.

The weekend of the shadowing

Andy and Alex have arranged their visit to Wales to get some footage for a music video piece they are collaborating on. They met when Alex saw some of Andy's video at an event; the original plan was for Dan, Alex's music partner, (who he also met through the group), to accompany them too but he is ill. The trip is to a wind farm and Alex has been investigating different wind farms, using the Internet as a major resource. During the trip Alex and Andy enlist an array of resources – people and things – in their creative activities. Building up to the weekend away they have kept in touch by phone, email, text messaging and IMC to chat with people directly. They have involved other people from the group in this way to seek advice and borrow equipment. Their choice of communications media depends on what is at hand and appropriate at that moment but cost is a factor and they will avoid making calls during the day and use text or email as a substitute.

To find their way to Wales they use the road atlas and computer printouts of the exact location nearer the destination. In their borrowed car they listen to CD's of Alex's music including the track they're to get video footage for.

Andy is using a digital camera that is new to him and takes time to adjust to it – he's used analogue equipment in the past. He wants to move to digital non-linear editing – using a computer – but is constrained by lack of funds. Andy talks about the limitations of digital cameras – older (analogue) cameras have more flexibility.

⁶ www.bigchill.net

Andy *"It's quite funny. With the older camera there was actually a lot more you could do to override. What I was thinking of though was to do a walk up shot..."*

Alex *"Is it compensating for a lot of things then. Is that what you mean?"*

Andy *"A lot of digital cameras tend to do that sadly which is why I have issues with them. Well, this is the idea of ... also when the track starts..."*

Alex *"Hmm"*

Andy *"If we can just have a walk... if we walk quickly"* - (the two walk whilst Andy holds the camera and films)

Alex *"Yes"*

Andy *"Trouble is you get the sort of motions you can't get rid of unless you've got a steady-cam"*

The conversation continues to contrast digital and analogue capabilities.

Alex wanders about looking for possible material and sends a text to his mother saying *'Hello from a wind farm in Wales'*. There's been no reception in much of the drive through the Welsh valleys but there is at the wind farm. Despite this Alex has two failures before successfully sending the message.

Disappointingly there is no wind and the turbines are not turning so the two men return to their overnight accommodation to discuss the footage they've captured and plan the next day. Alex uses his Nokia communicator to check the weather report on the web and the sunset times. He remembers the URL for the weather site rather than relying on a bookmark - bookmarks take up valuable memory on his device so he tries to avoid having too many. As he checks these details he also checks his emails.

Returning to the wind farm for sunset the pair rush to get some shots as there is less light than anticipated but at least some turbines are turning. Darkness falls and they head off for dinner. They talk about the Big Chill where they met and the communities that inter-relate with one another through this on-line group. Andy has been part of other on-line music communities but he met his girlfriend at a Big Chill related event. Through a subsequent posting she made to its on-line forum he discovered she like him and they got together. Andy has saved her posting and the threaded discussion that resulted from it on his Communicator and he shows it to Alex.

The next day they go again to the wind farm to collect more footage. Andy uses his communicator to find out what wind speed and directions are expected for the day but he can't get the communicator to access the web. As they use the camera they explore its capabilities to take distant shots of the turbines. The digital zoom is not as good as an optical zoom but they agree there are benefits to the image degradation that the use of the digital zoom produces. As they work they make

reference to the music, interleaving the memories they have of it with the images they are capturing.

On the way home they talk some more about the technology they use and in particular the tensions they have to deal with as 'creative' technology users. The limitations drive them towards producing particular kinds of creative expression but they really dislike technologies that restrict their ability to test out what they can do with them. The communicator, for example, is useful on the road for storing contact information and diary details and to access online information. However, because Andy sees it as having been designed in a restrictive way, and it has so little documentation to explain how to use it, he has become resistant to using it. He has contacted the supplier and discussion groups but has had very little success in learning anything useful.

Overall it has been a reasonably successful trip – it would have been better if there had been more wind. They were able to adapt to the differences experienced in using a digital camcorder from their more usual analogue achieved some new and pleasing creative effects.

Case Study 2 – Jim Barnes Consultant and Artist

Jim was interviewed about his work and his views on all types of ICT. He has a military and computing technology background. These days he alternated between consultancy and a few months painting - his art is displayed in galleries. His current work flowed from the area of web-based technologies that had become his speciality, although he had also consulted on enterprise scale technology infrastructures for management. He had just completed a consultancy assignment and had started a period of painting.

Although he would experiment with new technologies, he did not see himself as a 'gadget guy'. However with his extensive knowledge of ICT capabilities Jim is both a technology explorer and an enthusiast for innovative products that users can explore. When seeking consultancy opportunities he tended to build ideas and concepts that firms were already interested in. There was not much that was coming out that was really new. There may be new devices in the sense that they were all Bluetooth, but what could be done with it was new – for example, Jim thought it was ridiculous that no one does Bluetooth earphones, for music so that you could jog with a PDA playing music in your pocket.

Jim's Communications

Jim used all types of ICT and in so doing was constantly finding potential product solutions for problems he encountered. For example he doesn't use voice mail because he does gets too many to deal with.

Jim : *'You've almost, then, got another half day's work just sifting through all these voicemails, half of which will be meaningless, but there's no way of you actually knowing who's on the voicemail'.*

Jim noted it would be useful if, like emails, you could see the list of numbers associated with the calls – and then you could decide the order in which to listen to them. Instead what happens is that

'You ring up the IVR and it spells it all out for you and you sit there for half an hour scribbling notes frantically, missing half the things, playing them back again, then trying to delete all these messages so that you have got room for more...it's not an advantage anymore, it's a burden...and you're also working a damn sight more hours than you should be...so I try to avoid getting voicemail as much as I can.'

He was asked sometimes why he did not use 'all-in-one devices' combining the PDA and mobile. The answer was that it was not really 'all in one', for example, it had no Bluetooth and the wireless aspect was important to him. He saw no technical reason why the manufacturer could not have integrated all these features, but saw it rather cynically as a manufacturer's ploy to sell you something now and then sell a more integrated one as an upgrade later. He would have such a device if everything were integrated. Ideally he would want everything voice-activated dialling, *"computers remember numbers really well...I remember names and faces."*

Jim had six e-mail accounts: one for close friends, a second personal hotmail account and the rest relating to different business accounts. Sometimes if he had to send a large file, hotmail could not handle it and so he would send it from a work account, asking for a reply to his personal account. The accounts had their own inbox on his Outlook Express software, which allowed him to handle his email more effectively. His business account got a lot of sales email

Jim *"We can do this for you, these seminars here etc – I can choose not to read those. I would not want my business email to be bogged down with lots of person e-mail either. If I want to download emails to my PDA I want to be selective.... that's why I sift it out and manage it that way."*

His hotmail account had *"every filter known to man on it"* to avoid spam. The ISP holding his corporate accounts already had their own filters; hence he was not overwhelmed by email, because he knew how to stop it.

Talking about text he says: *'Text is arguably where email will end up if people just let it spiral out of control (...) it's like CB radio was...people stay up all night talking absolute rot just for the sake of talking...they weren't actually communicating in any way...it was one*

word answers...and that's exactly what will happen with text...people send the most bizarre texts, and it's almost like a little elite club where you understand the vernacular of what they're saying..."

Given he was critical of it, he felt almost forced into texting when someone sent him a text

Jim *"And I thought if I call them up, what am I going to talk to them about and how much is it going to cost me. I weighed it up and it was purely the cost."*

He only texted in reply to a text, and that was not often.

Jim had a PDA and he used it a great deal. What he wanted next was a laser driven keyboard, which they now make in Israel, so that an image of the keyboard is beamed in front of the PDA and his finger motions on it are interpreted and translated into word-processed documents. He could imagine sitting on the train and using it. There's a company working on 'magic glasses' to overcome the small screen problem.

The PDA synchronised with the PC and laptop via a cradle, infrared or Bluetooth. He could get web-access to the PDA if he wanted to.

He saw the problem with camera phones as being that they did not have good enough resolution at the moment. This good quality resolution was important for him personally since he came from an art background and composed good pictures with digital cameras. In principle it would be possible to build better cameras into phones or PDAs - ones with greater storage and capacity. However, if you have higher resolution pictures you then need a larger bandwidth to send them to other phones. He felt the current generation of picture phones were brought out bearing in mind the limits of their bandwidth capacity.

Jim said that he would love to do work with 3 on video, which had more serious implications.

In his view, the target market for the picture phones was people who use lots of text *'Hey look at this, this is what we're doing...it's instant photography, sending a crazy photo to your mate.'*

There were 'good' uses, such as at traffic accident and 4 years ago he had been working with a vet centre that serves around the world. Using the phone to take a picture of an injured horse in, say, Africa could help UK vets suggest a procedure for the local vets, providing a virtual operating theatre, where the UK vets were consultants.

Jim thought that giving away picture phones as add-ons a good ploy by mobile phone companies in a saturated market— if some people could take a pictures, maybe others in their social networks would ask for the

picture phone on the next upgrade so that they could receive the pictures.

Jim had lots of ideas about developing voice over IP and was quite animated about the possibilities that it could offer.

“...let’s say on one wi-fi network you could accommodate 60 telephone calls concurrently...how difficult would it be then to ramp up and have multiple LANs so we could offer the ability to enable anyone in Reading to make a phone call from any device that was capable of transporting an IP protocol....so it would not have to be a phone...it would not have to be a mobile phone...it could be a laptop, a PDA..., if it was clever enough it could even be a fridge (...) you could make a phone call from anywhere and from anything IP capable (...) you could have a Bluetooth headset that was all you need ...we could store your entire phone directory anywhere...and all you would have to say is “Call someone” ... and you do not have to pay for phone calls.”

Appendix 2: Observations of everyday life August 2003 - November 2003

Sunday in the Supermarket (UK)

It's 3.30pm the shop shuts at 4pm; there are about 60 people in the store. One man is standing at the deli counter with a list in one hand and a mobile phone in the other, he is talking 'Hurry,' he is saying urgently and looks back at the assistant who is waiting for him to choose. It seems that he is checking what to buy. There are 3 other men doing the same thing, one by the bread, one by the cheese and another at the vegetables.

My new phone (UK)

The car salesman dashes over the road to chat with friends in the shop opposite his. Have you seen my new phone? He has a video mobile phone and they all crowd around to see it. There are enthusiastic noises made but the onlookers seem nonplussed. A relative comes in with her baby and he shows her – she says take a picture of the baby. He takes the picture and shows it to her and then goes back to work playing with the phone as he goes.

The Cinema (UK)

Waiting for the film to begin – a lady appears to be taking pictures with a mobile phone -apparently trying it out or playing, she doesn't hold it to her ear but looks at the screen on the device; she is self absorbed pushing buttons and moving the mobile about. Her two young children seated either side of her stare at the adverts on the screen that include one saying please turn off your mobile phone in the cinema.

The Youth Leaders (UK)

7 women – average age 45 sat around a table discussing how to communicate with each other and the members on youth group matters. All use email except one (the chairman) so telephone and paper copy is actually used by all. All use mobile phones, one has the new video mobile phone – her son usually rings her to say where he is during these meetings or to arrange a lift. Her phone rang – she couldn't open the phone to answer it quickly enough as she got up to answer it away from the group. She missed the call and sat down. Others concerned at a possible family issue asked about it; she explains about the phone call and the new phone; the phone rang again – she got up and answered it successfully. She put the phone down on the table. It didn't ring again

but stayed a reminder to all of other family matters running concurrently - and that she had the latest phone.

Businessman on Train (UK)

Man (dressed as a businessman) makes a call on his mobile. He says 'I'm on a mobile, on a train' (call me back is implied or asked by the other person). 'Here's my number' He is phoned back and he starts to make arrangements, but loses the signal. He gets another call back and says 'I'm on a train so I'm afraid it's going to be a bit patchy'. He has a pen in his hand, but he makes no notes, he twiddles with pen and at one point writes a question mark on the newspaper 'I'm going to lose you. I'm out of circulation for the rest of the day, would you mind dropping Bill a note' He loses the signal again. This time he dials to continue, and apologises. He adds 'He's at home, he's on his mobile'. He ends the conversation and dials again (looks up the memory). He calls Bill to say he will be getting a note from the first person and explains a little, saying what to do (what is expected), asks Bill to send the first colleague a reply, and notes that he need to have a conversation with John. He ends the call and continues reading, with the mobile beside the paper

The Restaurant (Belgium)

A couple – a man and a woman – come into the restaurant. They sit down and immediately take out a camera phone. One is showing the other pictures on it and they are laughing holding the phone together and then passing it between them. It is dark in the restaurant and they hold a candle to the screen to see the image better. Later they take a call and again hand the phone between each other – the caller is audible and they are using the volume to join in a three way conversation over the one mobile phone

Shopping for toys (UK)

She has a young child about 2 years old in a pushchair and is by the toy display. She is speaking on her mobile phone and is discussing the variety of toys on offer, as she is speaking she is getting the boxes off the shelf almost as if to show the person she is speaking to but she doesn't have a camera phone. She laughs at one point about being on the phone, and then she holds the phone to the child's ear and says, "Do you want to talk to Daddy?" "Hello Daddy" says the child – she holds the phone to his ear whilst he listens and she looks at higher shelves and more toys. After about a minute the child turns his head away from the phone and she returns the phone to her ear continuing the conversation for at least another 10 minutes. She is seen later with two large bags of the toys she was discussing.

The Business Meeting (UK)

Five men and two women are at business meeting. Three are presenting using their laptops and another has a laptop. One without a laptop has a mobile phone and one, asked to join at the last minute, has only an empty paper cup with him and he fiddles with it during the meeting. One of the men presenting is using his laptop continuously and another comments that he is looking a web site – “Yes I can get wi-fi in here so I’m checking out a few things”. Each laptop is set up differently and each has to be plugged an unplugged into the projector which the user does with ease. The person with the mobile phone fiddles with it but does not appear to use it at any time. One of the women uses her mobile phone to check the time.

The Academic Conference (Finland)

There are 150 people, about 15 at anytime using laptops on their knees, some with wi-fi. A wi-fi power lead and phone charger point is constantly busy. The conference schedule is updated on its web site. Access to the web site for those without wi-fi is via three dedicated PCs – there is often a queue for them. Most people seem to have mobile phones and they do go off during presentations but few people actually take the call – although some do. There is a lot of face-to-face conversation in groups and people are comparing notes about devices as well as papers presented. The conference is recorded on camera and the proceedings put on the web site. An online chat room is available but not greatly used either during or after the conference. Delegates are emailed after the event to remind them to look at the web site when updates occur or feedback is requested.

The Business Seminar (Belgium)

No GPRS coverage, no wi-fi, poor mobile phone coverage the conference room is an island disconnected from usual business activity. People seem relaxed and are attentive. Only one mobile phone goes off and people ignore it – including the owner. Some have put their incoming call alert to silent for the duration of the event. 4 presentations are given via 3 laptops. The first two were copied onto a memory stick thereby overcoming some technical difficulties with a fourth laptop.

The Rugby Football Game (UK)

The match has started and there are nearly 8000 in the ground; it is raining and dark. Single people are coming in and looking for friends, they are speaking on their mobile phones and looking around with puzzled expressions. In each of six instances they take about three attempts to find the people they are meeting, walking or looking in one direction and then another– the point of recognition is obvious as they

make eye contact and wave. Each person continues to talk on the phone as they make their way to their seat.

Bowling(UK)

A group of teenagers meet to go bowling. Two of the girls get a strike and they celebrate. The boyfriend of one gets his camera phone out and takes a picture. The girls pose and then share the shots just taken with the others in the group – the picture has captured them in a suggestive pose and this makes them all laugh. They quickly scroll through the other images stored on the camera. One of the girls gets out her camera phone and shows the picture she has of her boyfriend. He is naked but his head is missing from the shot – *“You wouldn’t think he had such a good body looking at him would you!”* The boyfriend says *“You haven’t still got that photo have you?”* but he doesn’t try to delete it.

Appendix 3: Empirical Sources

Diaries and Shadows – all UK

Families

Three Generations of Families – diaries, interviews, photos (9)

Young adult ‘mobile addict’ – diary interview (1)

Social Groups

Members of a Dance Group (6)

Business

Small business – shadow & interviews (4)

Local Government – shadow (1 + team)

University – diaries and interviews (5)

Technology Explorers

Video Team – shadow (2)

Consultant – interview (2)

Consultant – shadow (1)

Location Observation – UK, Finland, Belgium

Teenagers socialising

London use in the street

Train

Conferences

Shopping

Business meetings

Restaurant

Leisure venues

ICT Questionnaire

Associated with diaries

Workshop and Conferences

Living 3G – Workshop organised by DWRC attended by 43 participants at the Wireless World Four Conference University of Surrey

Wireless World Four: Mobile Communications - a Retrospective
DWRC University of Surrey 17-18 July 2003 www.surrey.ac.uk/dwrc

Front Stage/Back Stage: Mobile communication and the Renegotiation of the Social Sphere, Conference 22–24 June 2003 Grimstad, Norway.

The Good, the Bad and the Irrelevant – Cost 269 Conference 3–5 September 2003 Helsinki, Finland www.goodbad.uiah.fi

Expert Panel Workshop discussions

Workshop 1 : Richard Harper: UniS & Appliance Studio; Sarah Morris: SkyBluePink; Jack Rowley: GSM Association; Maurice Patrick: Bear Stearns; Mary Embeling: UniS Sociology; Steve Hearnden: UMTS Forum

Workshop 2 : Nick Hunn: TDKUK; Joe Boorman: Research International; Sean Smith: UniS sociology; Jim Munro: UMTS Forum

Workshop 3: Dick Wallis: Bloodhound.co.uk; Elaine Axby: OFTEL; Julie Barnett: UniS Psychology; Amparo Lasen: DWRC; Antonio Liotta: UniS CCSR

Workshop 4: Lisa Harris: Brunel Uni; Stuart Newstead: Ellare; Lynne Hamill: DWRC; Erik Kruse: Ericsson (Sweden); Ruth Rettie: Kingston Uni

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