

Social Shaping of UMTS

Preparing the 3G Customer

Report 26

This report is the result of an independent study conducted by the Digital World Research Centre (DWRC) on behalf of mobile communications industry body The UMTS Forum. An alliance of Third Generation (3G) mobile network operators, equipment manufacturers, regulators and mobile developers, the UMTS Forum promotes the global success of 3G systems and services.

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Table of Contents

1	EXECUTIVE SUMMARY	3
2	HOW MOBILE COMMUNICATIONS WERE SHAPED BY THE CONSUMER	5
2.1	INTRODUCTION	5
2.2	ANALYTIC APPROACH.....	5
2.3	EVIDENCE OF SOCIAL SHAPING – BENCHMARKING THE PRESENT	5
2.4	DEFINING IMPLICATIONS FOR UMTS	8
3	THEME 1: SOCIAL CONNECTIVITY	11
3.1	FINDINGS	12
3.2	INTEGRATION WITH OTHER DATA	13
3.3	IMPLICATIONS FOR UMTS SUPPLIERS	13
3.4	INTERVIEWS WITH EXPERTS: REVISIONS OF THE IMPLICATIONS	14
4	THEME 2: EMOTION AND MOBILES	17
4.1	FINDINGS	17
4.2	INTEGRATION WITH OTHER DATA	18
4.3	IMPLICATIONS FOR UMTS SUPPLIERS	18
4.4	INTERVIEWS WITH EXPERTS: REVISIONS OF THE IMPLICATIONS	19
5	THEME 3: PUBLIC AND PRIVATE	22
5.1	LOCATION BASED SERVICES.....	22
5.2	FINDINGS	22
5.3	CURRENT PATTERNS OF USE	23
5.4	IMPLICATIONS FOR UMTS SUPPLIERS OF LBS.....	24
5.5	INTERVIEWS WITH EXPERTS: REVISIONS OF THE IMPLICATIONS	25
5.6	IMAGING AND MOBILE PHONES.....	26
5.7	FINDINGS	26
5.8	CURRENT PATTERNS OF USE	27
5.9	IMPLICATIONS FOR UMTS SUPPLIERS OF IMAGING	27
5.10	VIDEO TELEPHONY	27
5.11	INTERVIEWS WITH EXPERTS: IMAGING AND VIDEO	28
6	CONCLUSION.....	30
7	APPENDIX 1: GLOSSARY OF TERMS.....	35

1 Executive Summary

The research programme has identified and explored some of the key ways in which consumer needs and expectations have driven GSM technology and how those same or similar needs will shape future UMTS services and products. The purpose of this has not been merely scientific, but is intended to enable suppliers of UMTS products to be in a better position to plan, shape and develop their offerings. It will also enable them to develop more effective strategies for shaping customer expectations.

The need to do so is evident from the experience of technology innovation in other sectors. The most obvious example of a failure to appreciate social shaping factors is to be found in the fate of fixed line telephony at the beginning of the last century. Here initial expectations on the part of the supplier industry were that their technology would be used for business to business calls and for broadcasting content (such as news and musical concerts). In both counts the industry was wrong and this led to inappropriate investment, and delays in the development of products and services for where there was demand. More recently, the fate of office information systems has been similarly beset by misinterpretation of what their use and impact will be. By failing to understand how users of such systems shape them in particular ways, huge amounts of money and investment were squandered throughout the seventies, eighties and into the early nineties. The failure of attempts to deliver the paperless office during this period is perhaps the most obvious manifestation of this.

It is clear therefore that similar errors may be made by the UMTS community if they persist in being a technology led industry. Social shaping factors, if not as important as technological ones, are certainly necessary to understand and bear in mind in planning, in technology development, and in business strategy. A failure to take such factors into account will potentially undermine the commercial opportunities that UMTS will provide.

It was in light of this that the research was conducted. It consisted of three phases.

Phase One: The aims of this phase were to identify key social drivers for the development and success of GSM and related technologies that may be applicable to the introduction of UMTS technology.

Phase Two: The second involved deepening understanding of three social drivers themes, selected in close cooperation with the UMTS Forum working party on the project. Further data gathering and research was then undertaken, before initial drafts of the implications that these social shaping drivers would have for UMTS services and products were prepared.

Phase Three: This involved presenting those implications to key players in the industry, to test for their accuracy and relevance, and to enable a further refinement so as to deliver analysis of the implications that combine scientific and commercial-industrial understanding of what social shaping will mean for UMTS.

In summary, the key implications of the investigation in to these three social drivers for suppliers of UMTS are:

- 1) ***Mobile devices do not enable more social relations but more intensive relations with already existing social contacts.*** The key implication of this for UMTS is that GSM and related technologies have been shaped to satisfy the need for “personal telephony” which is built on the back of mobile technology. This will mean that it will be difficult, though not impossible, to extend users’ requirements for UMTS products and services into non-personal needs, especially business needs. Nonetheless, there will be significant opportunity for expanding and enriching the

experience of personal communications (such as through imaging).

- 2) ***Users have a more emotional relationship with their mobile phone than they do with other forms of computational device.*** The key implication deriving from this is that UMTS services and products that satisfy emotional needs will consist of person to person connectivity applications. The social value of these services will be much higher than the value given to person to information services. This will be reflected in the price sensitivity of each genre of application.
- 3) **The intersection of public by private behaviours enabled by mobile phones will reach a threshold beyond which resistance will start to occur.** The key implications from this are that, in the case of location-based services (LBS), user and regulatory resistance will occur if these types of applications are introduced without enabling more fine-grained permission-based control than is currently available. This will require considerable improvement in the man machine interface (MMI) of UMTS devices that will ensure that permissions can be provided on an ad hoc, 'as need to know' basis. The implications for imaging applications are that they will find wide acceptance if they encourage users to develop a form of use that is analogous to texting. This will involve such things as 'pictures for play'. If the shaping of consumer expectations towards this model can be done effectively, there is a strong likelihood that a considerable market will emerge for imaging. However, the implications for video telephony are quite different. Here the evidence shows that fully two way video calls will generate considerable resistance unless radical improvements in the MMI and form factor of hand-held devices is achieved. These will need to allow much more flexible 'user control' that ensure that recipients of such communications can manage precisely when such communications start and what is being seen by the caller when they do occur. Currently, changes in the MMI and form factor that will deliver these controls are not on the roadmap for UMTS.

2 How mobile communications were shaped by the consumer

2.1 Introduction

Although much has been written about the GSM, most of it does not address the subject in a way that would be useful for understanding how people might respond to UMTS. Instead, it treats the subject largely in technological terms. In addition, the speed of take up, the development of products and the growth in customisation was (and indeed remains) rapid, and this has resulted in the assumptions underscoring the basic GSM mobile communications technologies and products becoming increasingly varied.

Nonetheless, there is an increasingly large literature in the area of ‘user studies’ relating to the use of mobile phones (GSM and otherwise), and during Phase one of the research the Study gathered together research insights from this literature and combined them with the DWRC’s extensive data sets on user behaviours and social shaping. The Study then selected those hypotheses from the literature and research that appeared potentially significant, and developed various empirical activities that validated and deepened some of these research insights in Phase two.

2.2 Analytic approach

Methodologically, the approach used throughout was to focus on mobile communications from the perspective of the GSM mobile phone users. It was thus qualitative and involved reviewing anthropological, sociological and psychological studies of human behaviour, as well as ‘ethnographic’ research conducted as part of the Study. In benchmarking the present from this perspective, the Study was able to learn how mobile devices have shaped and have in turn been shaped by fundamental observable patterns of behaviour in society.

It should be clear, however, that the use of qualitative data produces insights and analysis may not be familiar to those organisations planning to deliver UMTS services and products. They may be more familiar with the kinds of techniques—primarily quantitative—used in engineering modelling and marketing based studies. Nonetheless, the kinds of insights that the research could deliver are sufficiently important that providers of UMTS services and products must attend to them irrespective of their familiarity with the data gathering and analysis techniques.

2.3 Evidence of Social Shaping – Benchmarking the Present

More particularly, the literature review undertaken in Phase one commenced with a judgment as to scope: though as has been said there is little literature citing GSM and social factors, there is in fact a great deal of literature on social shaping.

In order to set some limits, the Study opted to demarcate a historical point before which it would not look. This was the point at mobile telephony became omnipresent. In the UK and the rest of Europe this would have been the situation in the late 1980’s/early 1990’s where the analogue TACS/NMT mobile phone services had been available since 1985 and the new GSM digital service was launched in 1993. Elsewhere, analogue AMPS service was prevalent being upgraded to digital and then replaced by GSM by the mid 1990s. Meanwhile, the global adoption of GSM meant that for many nations GSM was their first

cellular mobile phone service and coverage was usually limited to major conurbations, albeit quickly extending nationally and often providing coverage where fixed line service was not available.

What the Study found in research reporting on the social shaping of mobile communications (disregarding the technical standard in question), was that although people quickly became familiar with the concept of mobile telephony, it was at the outset high priced and targeted at business users. Organisational management were, however, unpersuaded of the benefits the technology might provide, and initially the adoption of the technology within business was essentially on an individual basis, where individual staff adopted the technology and then gradually demonstrated to their colleagues the benefits they derived. Eventually, the business management as a whole began to recognise these benefits and so business began to be more willing to pay for and support mobile devices.

The regulatory framework of the time was created to address the issue of price, meanwhile, and leveraged competition that reduced the costs. In a crude sense this was social shaping of the most obvious kind. The UK market, for example, was structured as a 3-tier system and this meant that people had to buy their mobile phones from a Dealer/Retailer who was selling on behalf of a Service Provider who bought wholesale from the Network Operator. This prompted a new way of selling and buying telecommunications and a new economic structure of incentives and subsidies.

More importantly, however, whilst these regulatory changes did indeed reduce price, the products still remained expensive and thus were expected to continue to be primarily for business use. Yet, once businesses made the technology familiar to the public at large, there was an unexpected and rapid growth in non-business, consumer demand. This became so strong that, in less than a handful of years—by the mid to late nineties—a point had been reached where owning a mobile became a social norm, particularly in Western Europe and Japan. Paradoxically, the eventual saturation of the consumer market place was not reflected in a similar saturation of business.

In simple terms, the history of the mobile can then be described as, first of all, a period of individual business people pulling the technology; second, their success leading to a period of business management pull, which resulted in a sufficient level of familiarity with the general public for a third period during which the consumer at large adopted the technology very rapidly; fourth, this eventually resulted in the situation we have now where having a mobile phone is virtually a social necessity.

In many respects, this path of evolution and in particular, the unexpected uptake of mobile communications as a mass consumer product was a boon for the industry, though the fact that this was a surprise is testament to how ineffective the mobile industry was at understanding its market place.

This is all the more surprising when it is realised that the pattern of adoption of mobile devices is in fact common with the introduction of other technologies, including the fixed line telephone at the start of the last century and the introduction of televisual broadcasting technologies in the middle part of that century. Whether a similar pattern will hold true with UMTS, is, of course, part of the subject matter of the research reported here.

In any event, if this is the general character of the take up, the actual impact of the mobile phone itself is another matter. Initially the mobile phone did not displace other communications devices, most especially the fixed line. Certainly there was continual change in the technologies in the users' hands, but this had more to do with the cycle of new mobile systems being introduced and replacing updated antiquated technologies than in what the technology could do.

Overall however, mobile telephony created an addition to people's lives rather than substitution of previously existing telephony and communications systems. The result was that mobile phones expanded what is called in the literature the 'ecology' of communications technologies, and in so doing became as important to work, family and personal life as the fixed phone and other communications systems.

There were nonetheless substantial differences in this ecology, according to culture, social class and the myriad types of relationship consumers could have with providers and manufacturers. This relationship was mediated through not only the devices themselves but also in such mechanisms as billing and payments methods. Differences showed themselves in prepaid being a success in Europe and less so elsewhere, for example, and in the brand acceptance of some terminal manufacturers over others.

Research on these and other topics is quite extensive, and without wanting to go into detail about all of it (though those who wish to learn more can read the full report form Phase one), seven main areas or topics of inquiry can be identified. They are:

- i) ***Social relations***—To begin with, there is a consensus in the scientific community that mobile phones had—and continue—to reinvigorate social relations through providing a voice or text mediated form of face-to-face relations. Some commentators view this 'virtual presence' as counterbalancing the increasing social isolation created by other new digital media, such as interactive digital TV, computer gaming and the Internet. This benefit made mobile communications unlike other digital technologies and unique from the users' perspective;
- ii) ***Personalising***—It is also argued that with mobile communications, person to business relationships have become much more personalised than before, with mobile communications allowing more intimate and frequent contacts;
- iii) ***Particularisation***—Mobile networks provide much more fine grained, 'particularised' information about user behaviours than has been possible hitherto, though users did not—and still do not—perceive this as a concern nor has business effectively leverage any opportunities this provides. Much of this data has remained untapped (though new services are likely to latch onto its possibilities – location services, spam text and so on);
- iv) ***Emotion***—Many commentators argue that the relationship between the user and the device itself has become much more emotional with mobile devices than was hitherto the case with computational technologies. It is argued that this was a function of the social connectivity that mobile phones afford and reflects a relationship with the content delivered via the device more so than the device itself;
- v) ***Private behaviours***—Mobile phones result in more private behaviours in public spaces than ever before, with gradually fewer boundaries to acceptance of where and when people can use their mobile phones. This is a world wide phenomenon, though the extent to which it occurs varies between different countries;
- vi) ***Mobile interaction***—Though the evidence is sparse, it is also argued that there is an increasingly distinct form of interaction on mobile devices, which involves frequent, short duration, and low content needs. This has emerged partly because of network quality and cost and partly because of new social behaviours where chit chat by voice and text have

replaced more focused, lengthy communications behaviours;

- vii) ***Pattern of augmentation***—Finally, research has demonstrated that mobile phone users have been and are likely to want to remain ‘in charge’ of the process of augmenting their mobile applications and services, and this is reflected in the way they chose to adopt some services and products and not others, disregarding the attempts of the suppliers to do otherwise.

2.4 Defining implications for UMTS

Clearly, the dimensions of the social shaping of mobile technology are then many, and it is not possible in even the most lavishly funded research project to examine them all. Besides, not all of these dimensions are likely to have the same impact on the evolution of UMTS. It was in light of this that the research team, in close consultation with the UMTS Forum, therefore selected three social driver themes for further exploration.

These three themes were derived from the initial set of topics, and were then further refined and developed so as to make for testable propositions of how social shaping factors might affect UMTS products and services.

They were:

- 1) ***The intersection of public by private behaviours enabled by mobile phones will reach a threshold beyond which resistance will start to occur.*** Prior research had suggested that public spaces are being invaded by private behaviour but that at a certain point resistance to this change would occur. Two specific areas of private and public behaviours were therefore explored, in relation to this issue. The first was the potential use of location-based services; the second was the use of mobile images.
- 2) ***Mobile devices do not enable more social relations but more intensive relations with already existing contacts.*** Prior research has suggested that mobile communications are creating changes in social relations. The first element of this thesis is that mobile communications are increasing the degree of connectivity between people, but that this connectivity does not increase the numbers of people that are in contact with each other rather it increases the frequency of contacts between the same people. The second element of the thesis is that mobile phones are creating an opportunity for new and informal relationships in business in particular.
- 3) ***Users have a more emotional relationship with their mobile phone than they do with other forms of computational device.*** This thesis did not indicate that users did not have emotional facets to their relationship with other technologies; it was rather that on a scale the character of the relationship with the mobile was more emotional than any other. Moreover, this resulted in certain kinds of behaviour that one does not find with other technology.

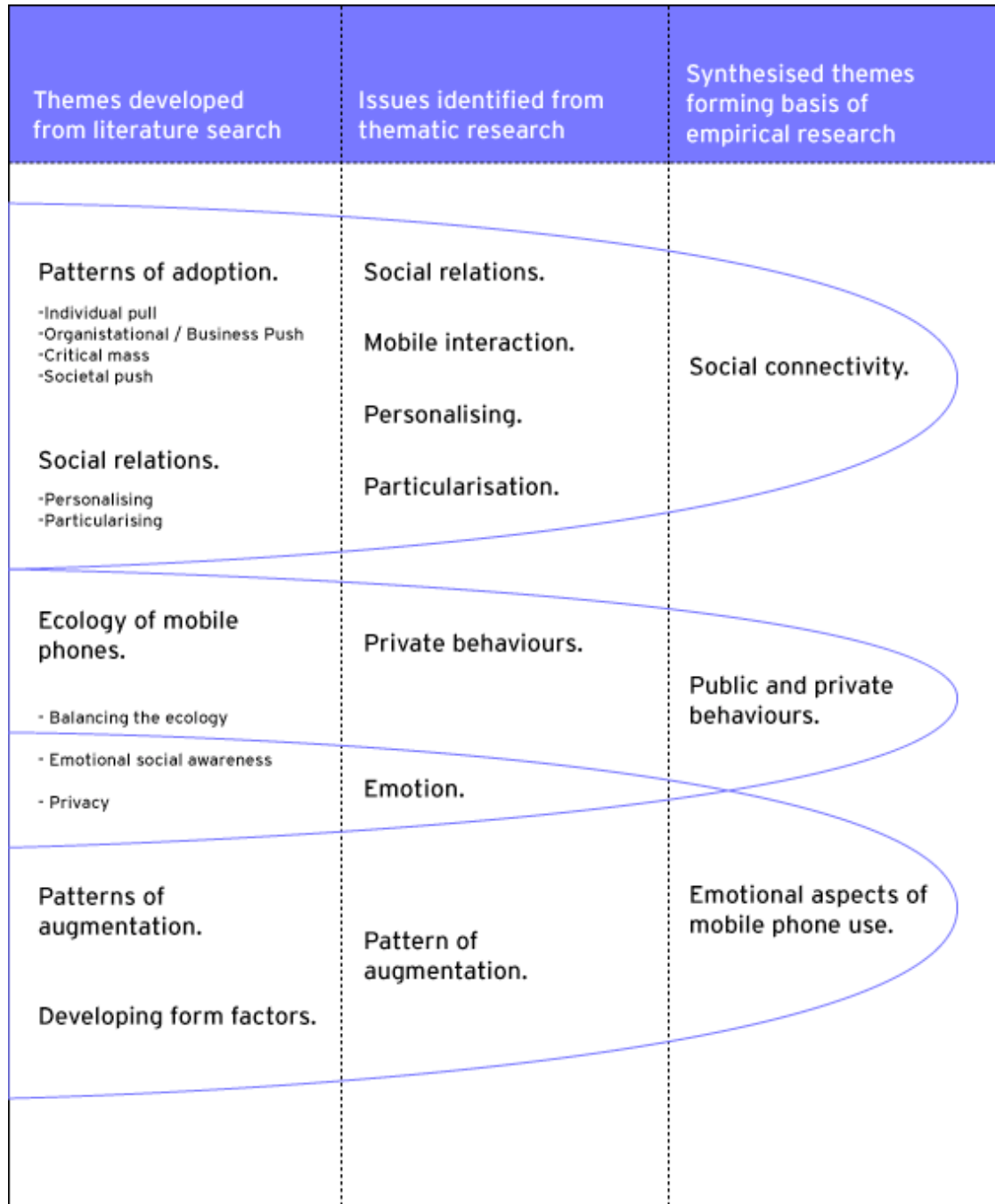
The taxonomy of the links from initial research in Phase one, the dimensions that could be identified in the research corpus, and the resulting themes selected for further investigation study, are represented in Figure 1.

The work itself involved new first hand data gathering, as well as the inclusion of the latest literature dealing with these topics. Data gathering involved focus groups activities conducted simultaneously in Germany (Erfurt) and in the UK (London and South East); a questionnaire; and direct observation activities of user behaviours in the UK, Germany and to a lesser extent France and Spain. Data were then combined with other newly

reported scientific research so as to develop an interpretation of the implications of these social shaping drivers for UMTS suppliers. The research team then presented these analyses to key players in the mobile industry and refined and revised its views accordingly. This consisted of Phase three of the research programme.

Each of these themes and the resulting implications, including the revisions generated by discussions with experts, is presented in the next section of the report.

Figure 1: Flow chart showing the capture of the data and synthesis into the 3 core themes



3 Theme 1: Social Connectivity

The first theme that was investigated as part of Phase two of the research programme had to do with the assertion, made extensively in the scientific literature, that mobile phones are increasing connectivity. By this is meant that people are calling each other more often, but are not calling more people. This is good, according to many social commentators, since the social nexus that ensures that people remain effective members of a community, is made stronger by the ability to call any time any place.

Moreover, a further related suggestion was that mobile phones are creating an opportunity for new and informal relationships in business. In this sense, the any time and place properties of mobile telephony are enabling not only an increase in business to consumer connectivity, but altering the character of those relations to become more personal. This too is viewed as good for society.

One of the salient features of this argument is the recognition that the changes that have been brought about since GSM and its precursors have more to do with consumer to consumer than business to business connectivity. Thus, though it might have been individual business people who started the 'user pull' for mobile telephony, the general consensus is that by the end of the last century this pull was essentially from consumers.

Curiously, though the arguments about social connectivity and the personalisation of relationships is made often, there are few quantitative measures of this, though it would seem ideally suited for quantitative techniques.

In the case of this programme of research for the UMTS Forum, it was clearly inappropriate—not to say impractical—to undertake an extensive quantitative examination itself, and rather, what was viewed as necessary was to generate sufficient hard data to give an 'in principle' confirmation or disconfirmation to the ideas.

It was on this basis, and with the agreement of the UMTS Forum, that a specially commissioned questionnaire was prepared by the research team and circulated in the UK, France and Germany. This generated quite detailed information about usage patterns and motivations, and was completed by a little less than fifty persons. This was sufficient for statistical modelling but the sample was not proportionally representative of socio-economic groups.

Data from the questionnaire were combined with other data from focus groups and ongoing research at the DWRC. The data thereby produced were then further tested with members of the expert panel from the industry as part of Phase three of the research programme.

To summarise, the research confirmed that it is the previously existing social groups of people who are contacting each other, rather than a broadening of social connectivity that is delivered by mobile telephony. People who knew each other before the onset of GSM now use the technology to call each other more often. This is essentially for social purposes: friends and family keeping up with the action. Similarly, if calls are made to business contacts, these are essentially contacts who are friends and close colleagues; they are, in other words, keeping in touch, not necessarily doing business.

In this sense, mobile phones are essentially personal devices, sustaining personal lives and commitment. They are less likely to be technologies that allow business to continue any time any place.

In addition to this, the research also suggested that the value given to these needs was

fairly high, and this was in contrast to those other needs that could and indeed sometimes are satisfied with mobile technologies, such as their use to alleviate boredom and to play. This differential in the social value given to these distinct activities had also been mentioned in the literature though again, not with any adequate measures.

3.1 Findings

More particularly, the research found that the primary value of the mobile phone is perceived to be for functional activities that sustain social lives. The use of mobile devices strengthens existing relations but does not widen social connectivity.

Relationships with business clients over the mobile are, meanwhile, minimal; perhaps more importantly, mobile phones are used less for communication with business clients than with business colleagues, family and friends.

Figure 2 indicates what are the kinds of tasks that mobiles are used for and the types of person they are used to contact.

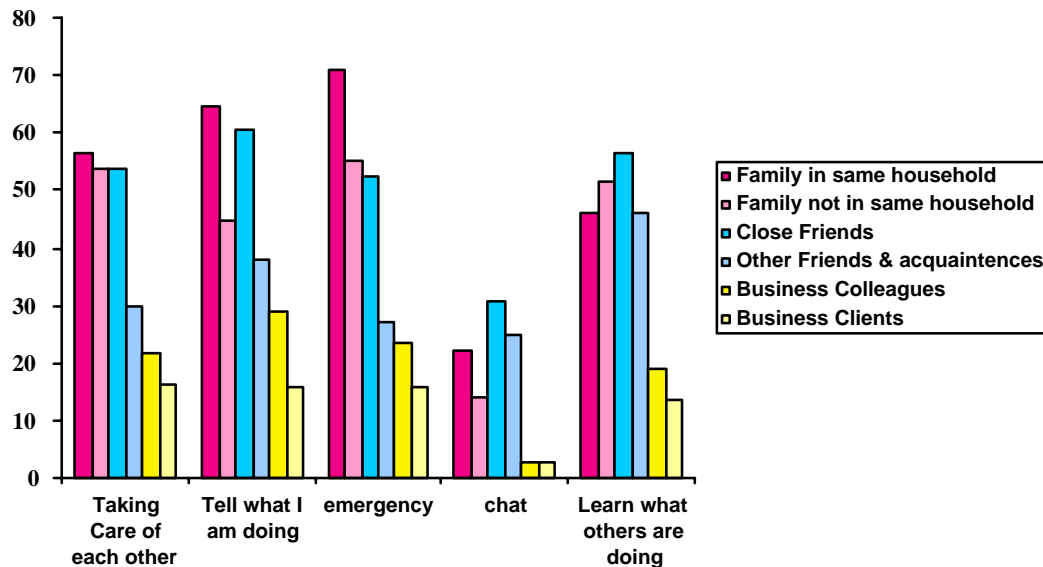
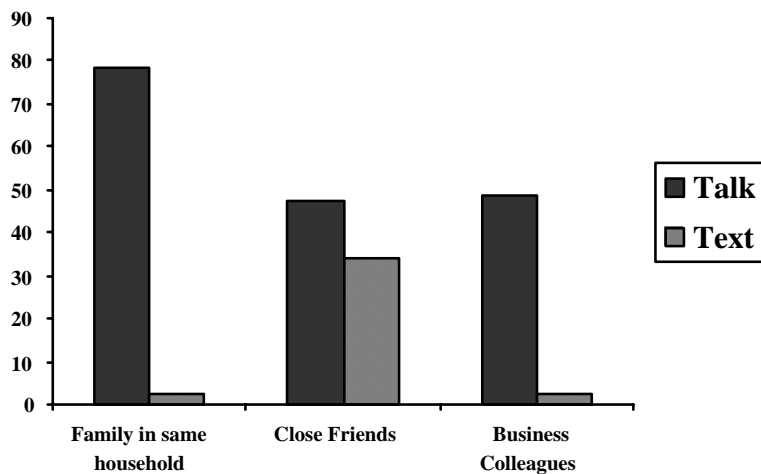


Figure 2 Percentage of respondents who agree they use their mobile phones for these types of communications (source: DWRC Questionnaire 2002)

Though there was a keenness to avoid suggesting that this happened often, respondents also indicated that they mostly use talk with family in the same household and mostly use text with close friends. Mobile talk is used for staying in touch with business colleagues more than text; and neither medium is used very much to deal with business clients.

Figure 3 (below): Percentage of respondents who agree that they mostly use talk and text with family in same household, close friends and business colleagues. (Source: DWRC



(Questionnaire 2002)

Though the topics for this theme of the research had to do with social connectivity, certain issues related to the fears that go with mobile phones also raised themselves and these are worth mentioning. Many subjects expressed a concern that health issues were still unresolved, for example, and this led some people to lower their use of mobile phones. More importantly for the research theme, however, many people remarked that the mobile phone is increasingly becoming the only place that they have all their social and family phone numbers and consequently, the potential loss of their mobile could create havoc.

3.2 Integration with other data

Other data taken from direct observation and the scientific literature, added further confirmation that people use mobile phones to achieve what one might call the functional prerequisites of social connectivity—organising their lives and keeping up ‘with the action’ (as they say). People do not admit to using mobile phones for what one might describe as non-functional, low perceived value activities such as for fun and to alleviate boredom. Thus, the perceived utility value of a mobile phone is to be in touch with close friends and family, it is not viewed in terms of fun, or more generally for person to information interaction.

3.3 Implications for UMTS Suppliers

The key lesson from this is that people are not expanding their social horizon with mobile telephony. Rather, they are using the technology to organise their life and preserve (and indeed deepen) their social connectivity. The value of this social connectivity is great, and so there may be some cost inelasticity in the use of the mobile to support it. In contrast, the use of the mobile for fun or to alleviate boredom may be creating costs that cannot be

justified by the benefits accrued. Indeed it could even be said that such activities may be a step too far if costs become too noticeable.

Given this, the primary implication for UMTS suppliers is that they need to assume that their products and services will be taken up by members of already existing social networks (consisting of personal and business contacts) rather than through entirely new networks of users, such as a new breed of post-3G mobile professionals, for example.

If this is so, then UMTS suppliers can map out these networks and use various tools to market to them, in much the same way that fixed line operators have offered 'friends and family' deals for many years. In this way, UMTS suppliers would be reinforcing the behaviours that have generated the demand for GSM networks. Having built on these social networks, UMTS might then be able to develop opportunities to start encouraging other uses of the UMTS services, such as for M-commerce.

However, this may be difficult to do. This is because there may be substantially different cost elasticities for social connectivity services as against other types of services, such as M-commerce. These two types of services may be called person-to-person services and person to information services, respectively. The latter sets of services may be thought of as analogous to those transaction services provided on the World Wide Web.

The evidence shows that people are willing to pay a healthy price for their person to person services (since it sustains their social lives, and thus has a high social value) but that they might be much more sensitive about the costs of information use. Given that access to information in the broadest sense is key a goal of UMTS, this needs to be addressed very carefully indeed.

3.4 Interviews with experts: revisions of the implications

The expert panel comprised people from a range of operators and terminal manufacturers in a range of European countries. Despite this wide spectrum of backgrounds and perspectives, there was consensus that the preceding analysis was correct. All agreed that GSM devices are used for social connectivity. In is in light of this common understanding that the UMTS industry is developing new product propositions designed to address social connectivity needs.

In the shorter term these products have to do with such things as sharing messages and images that relate to the concerns of the particular social group in question (such as 'football goal of the day' etc). In the longer term, the expert panel believed that the UMTS market can be expanded by using those social connectivity applications that have succeed on the internet and delivering versions of these over UMTS networks.

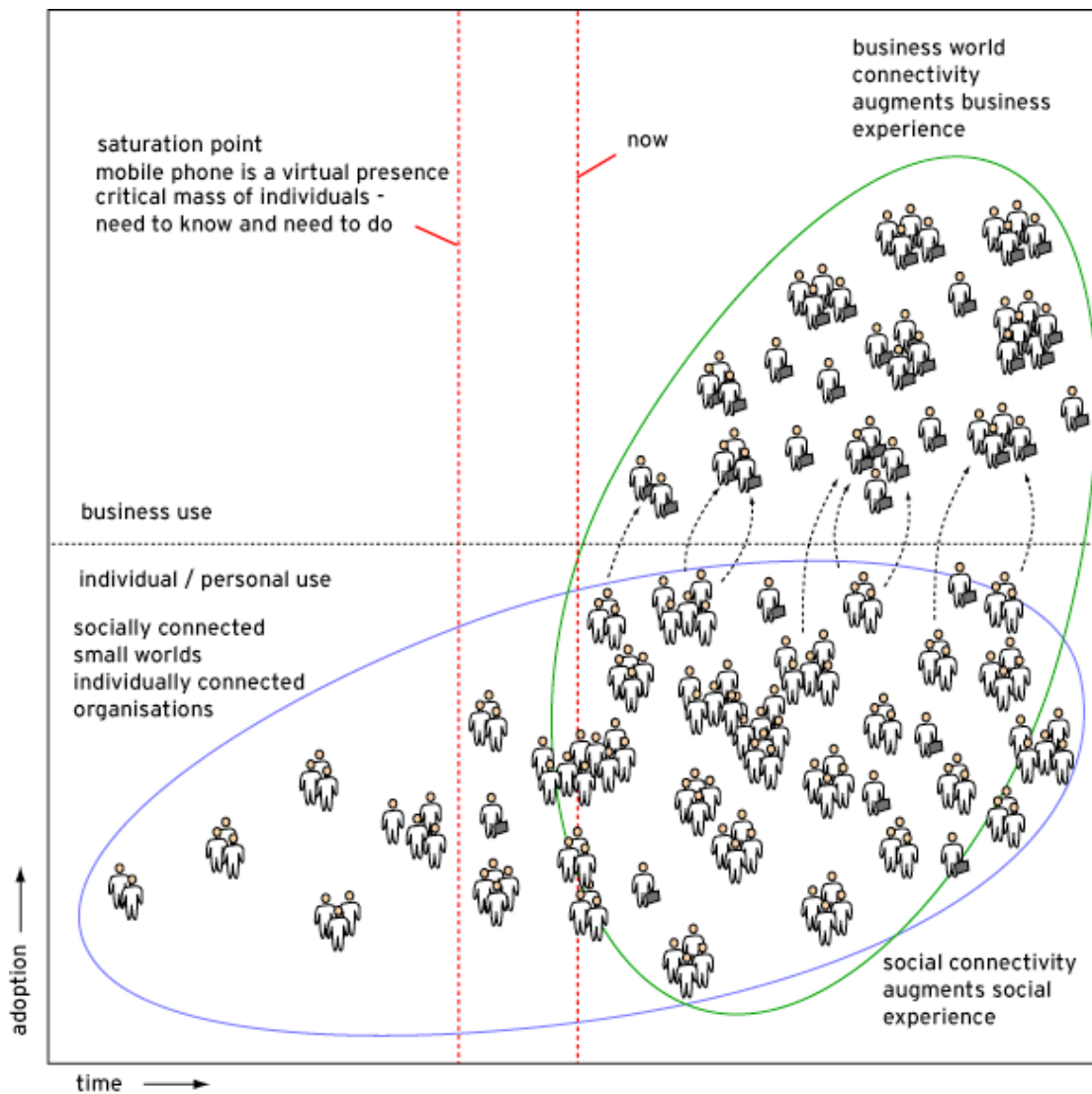
Here, mobile email, instant messaging, and internet chat rooms were all cited as genres of social connectivity that might help expand the UMTS market place. Underscoring this vision was the belief that UMTS products would complement and thus expand those offered over fixed line internet. This would encourage greater adoption of mixed media amongst users, something that the panel believed acceptable given the take up of SMS by consumers.

There were some differences between the panel and the research analysis. One minor difference had to do with the belief that quality of service over mobile networks is a greater inhibitor than the research evidence suggests. Such a difference would be expected to disappear with UMTS, of course.

More importantly, only a proportion of the panel believed that social connectivity services would be more price inelastic than person to information services, though those who did recognise this also believed that there would be significant ways of leveraging these

differences. One suggestion was to use different price mechanisms for person to person connectivity as against person to information connectivity.

Figure 4 Road Map for Social Shaping of Social Connectivity



Explanation

This figure shows that the adoption of mobile devices sustains fairly small social worlds. As saturation levels increase, so the numbers of the social worlds supported increases too. Only a small proportion of these social worlds consist of business to business use. In the longer term, the intensity of the social connectivity communications may increase and be enriched by more services and applications. Costs for these services will be inelastic. In the longer term, there may be an opportunity for augmenting social connectivity amongst business users.

4 Theme 2: Emotion and mobiles

Research in phase 1 produced the hypothesis that users have stronger “emotional” relationships with their mobiles than they do with other forms of ICT. This was meant not in the sense that they covet the device (as in a symbol of a life style) but because they have come to depend upon it in ways that is crucial to their emotional lives. The Study sought to ask whether this is true and if so, what implications does it have for 3G?

For this, the Study combined state of the art research plus newly gathered first hand evidence. This evidence was generated by focus groups undertaken in the UK and Germany. Data from these were to be used to explore the hypothesis in terms of how people “account” for their emotional experience with their mobile phones and to distinguish between sayings and actions. Thereafter, some further analysis was undertaken by looking at the use of the term emotion when exploring relationships with other forms of technology. This was integrated before implications for UMTS were defined.

4.1 Findings

People do have a distinct and essentially emotional relationship with their mobile phone. This reflects what the phone enables them to do in terms of being in touch with those they are close to, in the way that the mobile enables emotional and spontaneous behaviours, and in the ways in which people account for and think about their phones.

More particularly, few people use the term emotion to describe their relationship with mobiles: *“It’s a funny way of putting it”* being a common response to the proposition. However, most people do in fact use emotional language categories to explain their mobile usage: these categories include panic, need, desire, anxiety, etc. Users also achieve emotional goals with their mobiles as well as undertake emotional behaviour. For these reasons, the claim that there is a highly charged emotional relationship with mobile devices is correct.

More particularly, the emotional language categories used to account for the mobile experience are listed in Figure 5.

People’s use of mobiles for emotional goals has a number of facets. Perhaps the most obvious has to do with setting up social arrangements: *“I call my friends ...stupid calls...I’m meeting them in half an hour and I’ll call them, speak to them... until I meet them”*.

Another has to do with avoiding making set appointment times - just arrange to call when you get there: *“meeting in a big park of people”*.

And a third (though there are more) has to do with making or breaking relationships: *“You can be silly on texting, you’re too embarrassed to phone”*; *“If I want to speak to my girlfriend any time of the day I know that I can & it kind of takes the fun out of it when I’m seeing her.”*

Emotion	Explanation
<i>Panic</i>	absence from the device; being separated from it
<i>Strangeness</i>	between those who do and those who don't have mobile phones
<i>'Being Cool'</i>	chilled out, tuned in to the mobile phone culture
<i>Irrational Behaviour</i>	can't control heart over mind e.g. driving and talking
<i>Thrill</i>	novelty, multi-tasking, intimacy of the text received in public
<i>Anxiety</i>	fear and desire: e.g. not knowing and wanting to know about others vs too much knowledge

Figure 5 Summary of concerns about Emotion and Mobile Phones

In addition to emotional goals, users also behave 'emotionally' in the sense of behave in irrational ways. They constantly call their partner/spouse, for example, even when they are in the same house: *"I just feel the need to"*.

They use the mobile impetuously: *"I just had to call someone"*.

And even though they know they should not, they use it in places that creates danger: *"Even when I am driving and I go over those mini roundabouts in 4th [gear]."*

If these are three rather closely related issues, there was also a larger view. Users think the mobile phone helps them enjoy their life more: *"But it's not changed who I am"*. They think that the mobiles are important: *"But might be getting too dependent on them"* and lastly, the importance is so great it makes the mobile too valuable: *"I don't take it to the club 'cause it would be terrible if I lost it."*

4.2 Integration with other data

General research on emotion mostly focuses on how form and function create emotional desire for a mobile device: such a desire has to do with life style and identity. This is much like other ICT research. There is a little scientific data on the emotional character of the use of mobiles across Europe: particularly for the emotionally preoccupied (teenagers), but it does not say much about what that emotional character might be.

Nonetheless, combining all the evidence that there is makes it clear that mobiles are experienced in a way that is distinct from other ICT.

4.3 Implications for UMTS Suppliers

Using emotion in the way described here to maximise the potential of products and services is challenging not least because it demands a level of understanding of customers – existing and potential – that is not normally known. More particularly, it demands knowledge of the purpose of the user's communications and how those purposes deliver the emotional value that is so important to them.

The use of SIM card readers by some Service Providers to collect and store information held on mobiles – phone numbers in particular – is a present day example of a service that responds to users' fear of losing data but goes only a small way to addressing how to do so in a way that reflects the emotional value that same users place on information stored on their phone. Much more needs to be understood about how emotional values are

delivered and preserved before UMTS providers can identify ways of leveraging opportunities related to emotion.

Failure to understand these emotional values can lead to problems. New services could be jeopardised if they replace or impinge upon services to which the user ascribes an emotional attachment. For example, the threat of losing text messaging and having it replaced by new technologically better services may create considerable resistance. For not only is texting now a key tool in sustaining emotional lives, but storing personal text messages is now a highly valuable element to people's emotional arsenal. SMS may be thought of as simply a communicative technique from the supplier's point of view, but to the user it has values over and above this.

Relatedly, the adoption of new form factors may affect these emotional values. For example, the current size of GSM devices supports constant carrying around: *"it never leaves you"*, as one of our subjects put it. This means that users are never forced to relinquish contact with those they need to be in contact with. Now, it should be clear that before GSM they would have had to be out of reach for certain times of the day and in certain places. The point is that with GSM they have come to expect this constant access. Future devices must not threaten this. Many UMTS services and products require larger screens than most current GSM devices require for example, and this may lead to expanding the form factor to a level that makes constant carrying difficult or at least irritating and burdensome.

Similarly, one-handed input means that it can be used at almost any time *"even when driving"*. Many smart phoned devices, particularly those which combine the PDA form factor with soft keyboards for dialling and so forth, require two handed in-put. This inhibits the places in which they can be used. Clearly in some respects this could be advantage: stopping people using the mobile while driving may be viewed by some as a way of increasing safety on the road, for instance. But for many users it is precisely the ability to be in touch at any time that provides the value that has made the GSM phone distinct. Assault these values with new UMTS products, even if it is only at the edge, and the overall value may be diminished.

Beyond these specificities of form factor and service change inertia, a further and perhaps more significant lesson is that demand for services that sustain emotional lives may be highly inelastic: people may pay "whatever it costs" to have and use a mobile phone (though the cheapest will do).

The reverse side of this is a value paradox, by which we mean that the value of the mobile makes losing it too risky. More importantly, other technologies (e.g. the home PC) do not gain the same value. In this sense, the threat of convergence of the PC, the PDA and the mobile may not be real.

The findings also have implications for the unpacking of internet information from "words" (voice and text). Person to person connectivity services engender emotion; this is where the value lies. In contrast, 'person to information' connectivity does not achieve the same emotional value. This resonates with the previous findings on social connectivity, and indeed gives further weight to the importance of person to person connections as against person to information. The implication is that money can continue to be made through developing person-to-person connections, and much less from person to information connectivity.

4.4 Interviews with experts: revisions of the implications

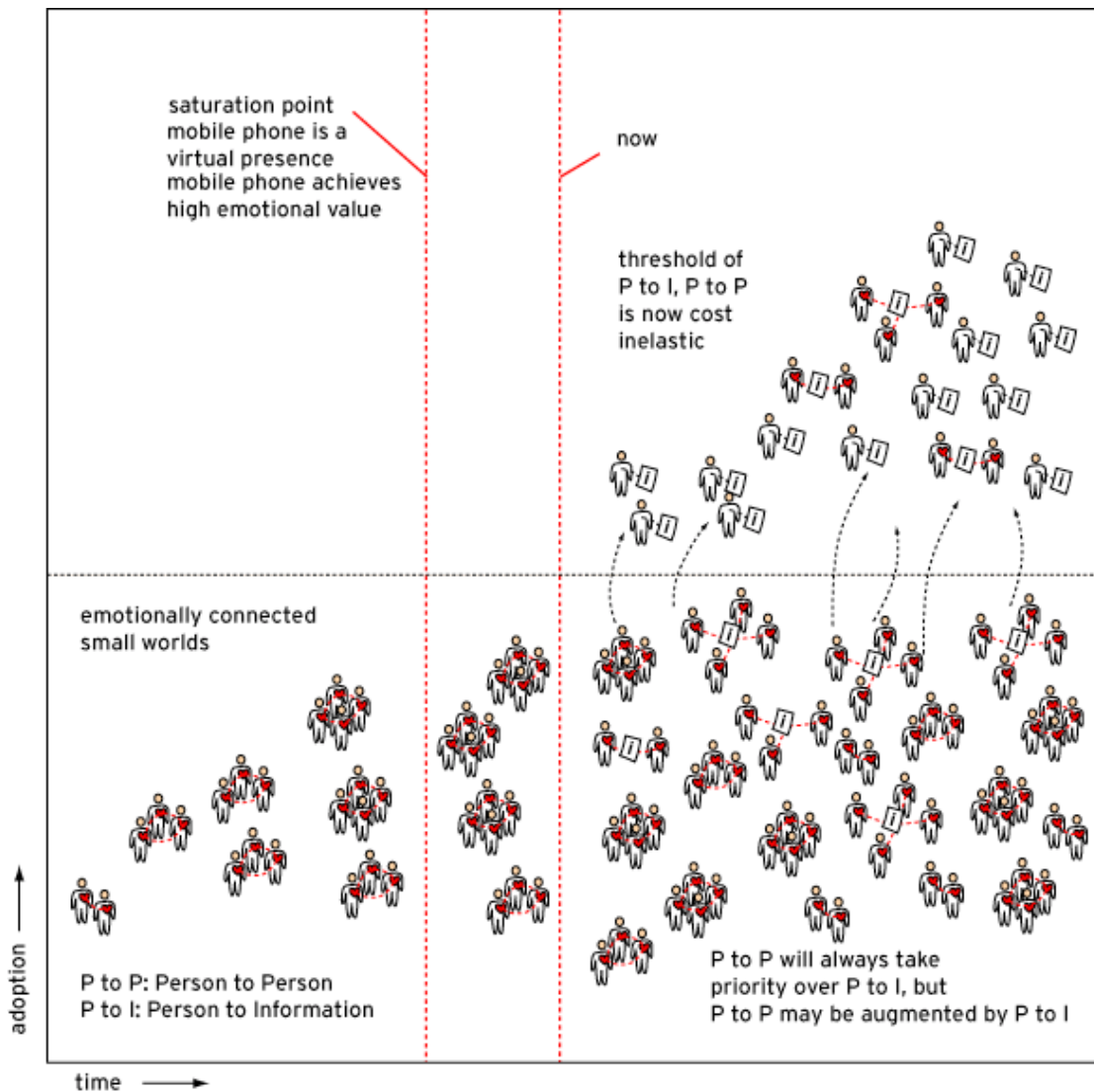
The response to the thesis was generally confirming, though the extent to which the relationship with mobiles could be described as emotional varied according to cultural

differences. Some readily agreed that it was clearly emotional, while others said that they agree the relationship could be thought of as emotional even though users were unlikely to coin that phrase themselves.

All concurred, however, in believing such things as the personalisation of GSM devices (colour, directories, ring tones) was less a reflection of the normal pattern of the evolution of consumer products (where personalisation to some degree is used to differentiate products) as it was an indication of the particularly emotional character of the users attitude toward mobile devices. Some even remarked on the way mobile devices are held and touched to affirm their belief that the relationship with mobiles is indeed different, cultural differences of expression notwithstanding.

Looking toward the future, the expert panel commented that, in the first instance, they will attempt to leverage emotional values to identify and sell new products. Key to this will be using emotional relationships between friends as a route to offer services and products that augment those relationships. Gradually, and in the longer term, the panel explained that they would introduce products and services that would be less and less emotional, thus leading themselves out of the confines of satisfying purely emotional needs. Their view was that they need to start developing UMTS services through leveraging person to person emotional needs, and then, step by step, introduce more person to information like services.

Figure 6 –Roadmap of the Social Shaping of Emotion and Mobiles



Explanation

The roadmap shows that the consumer market place is made up of masses of emotionally connected and interconnected small worlds. At the current time (the bottom left hand side of the figure) there is little person to information use. As UMTS products appear, however, they will need to be based on these emotional ties, and achieve some augmentation of person to person connectivity with some person to information connectivity. The figure also shows that providing person to information connectivity may be difficult since there may be greater price sensitivities for such services than for person to person connectivity.

5 Theme 3: Public and Private

According to many scientific commentators and recent research conducted by the DWRC, GSM mobiles created and continue to create a blurring of social codes of mobile usage for public and private spaces. After the initial shock (in the early nineties perhaps), now almost ‘anything goes’: people will use mobiles for any type of communication anywhere. However, the evidence also suggested that new products and services might be a “step too far”. In so doing, new products may lead to social and regulatory resistance, with signs saying “No mobiles here please!” becoming more common.

To investigate this, the Study combined state of art research plus new first hand evidence to explore family, social and business use of Location Based Services (LBS) and perceptions of imaging on mobile phones. New evidence was gathered through focus groups in Germany and the UK. These data were then compared and contrasted with data gathered through direct observation, given that prior research has repeatedly demonstrated that what people say (in focus groups especially) is not always what they do.

Findings from the research indicate that the future for each type of services is potentially quite different, with different aspects of technology design and service provision impacting upon take up. More particularly, LBS and imaging were treated as distinct topics of inquiry.

5.1 Location Based Services

Location based services are already in use and new services are being introduced at an increasing rate. The Study asked people what they thought about location based services in general rather than about specific products and it mostly considered tracking, locating people and advertising as the service principles.

5.2 Findings

Location based services engender a two handed response from potential users: on the one hand there is a recognition of the value of such services; on the other, the potential disadvantages of such services are perceived as great. These disadvantages, rarely if ever to do with costs, and more typically perceived as having to do with preserving good relationships with people (whether it be friends, family or work colleagues) are peculiarly sensitive to location related issues. Accordingly, mishandling of LBS products and services by suppliers and operators could well lead to a push back from users and even the regulators.

More particularly, in focus groups, both in the UK and Germany, the Study found that seven dimensions of tension are used to account for consumer views on the topic of LBS. These are presented in Fig 7. The top two are the most salient.

Focusing on this last dimension, family life, it became clear that parents felt that tracking teenagers would be “*terrible*”, “*offensive*”, “*horrible*”. This reflected a recognition that the benefit of tracing children in trouble would be countered by an awareness that overprotective parents could misuse the facility. Imposing artificial location limits on teenagers were also deemed unacceptable, since “*it takes away your (e.g. children’s) ability to cope*”.

Paradoxically, the perspective of teenagers and children was quite different. Though they admit that they would turn off or throw away their mobile phone to avoid tracking by their parents, teenagers like being able to locate their friends, and most teasingly of all, teenagers like to be able to locate their parents.

LBS	Explanation
Coping vs. reliance	which has to do with managing oneself versus relying on others
Trust and Distrust	and the question of ethics, conflicts with freedom and learning social skills;
'Big Brother' and Motive	which labels a concern with who is using LBS information and how trustable are they?
Hiddenness vs. Explicitness	which has to do with who one might be willing to tell about one's location;
Exceptionality vs. routine	which reflects a concern that LBS would only be useful in certain cases;
Push vs. On Demand paradox	where there is a recognition that LBS may provide information that is not needed or not providing access to information that is;
Family Coping and Reliance	which has to do with complex relationships of dependence and independence characteristic of families

Figure 7: Summary of focus groups concerns about Location Based Services

Moving away from the family and thinking about LBS more generally, trust and distrust had to do with things like how the information would be used: one person summed up the ambience that LBS might create: *"you'd get paranoid"*, and interestingly, this would apply to both the user and the subject.

If a third party were used to mediate location information (i.e. a third party accessing information for the operators) there was a concern as to who this should be: the view of subjects here was not that it might be the local curry house—an example often cited in the LBS literature—but rather Big Brother.

In this light there was some resignation that LBS would be like CCTV, with the view that *"This may happen anyway and people will just get used to it"* being heard several times. A key difference, of course, being that CCTV is in spaces already defined as public, whereas with LBS, what is public and private is blurred.

Concerns raised with the business use of LBS had, first of all, to do with similar issues: namely, coping, reliance and utility. *"It's telling me stuff I don't need"*; *"Sometimes I do need information, but how does it know?"* *"What would I do with it anyway?"* reflect the views expressed. Combined with this was concern that as with parents and children, LBS might have the effect of reducing people's ability to cope, despite the fact that *"They have got to get on with it by themselves"*.

Besides, subjects made it clear that people do not like the idea of being checked on themselves nor automatically knowing where employees are. Both were viewed as intrusive: *"people don't give their best if they think you're on top of them"*, Tracking or limiting staff within an area is also unacceptable, *"It would be like saying you don't trust any of your staff"*. The best overview of this concern was expressed in the following way: *"Because Technology CAN do something it doesn't mean it should"*.

5.3 Current patterns of use

Though the focus groups data was rich with insights and issues, the DWRC team juxtaposed that data with what is known about mobile behaviour. Behavioural findings show that the use of mobiles is, as it were, "saturated" with location sensitivities. Yet it also shows that though mobiles are used to connect to "any place, any time", this benefit is managed.

For example, people start mobile phone calls with “*Where are you?*” That they do so demonstrates that people negotiate the right to intrude. Another example of such negotiation, sometimes tacit, sometimes explicit, can be found in the use of text after 11pm so as to allow recipient to allow or not allow interruption, or similarly the use of text when the recipient is in a meeting.

In other words, the reaction to LBS scenarios in focus groups and other research needs to be placed in a larger context, in particular, in regard to the fact that users currently manage levels of intrusion enabled by mobile communications in subtle but nonetheless conscious and efficacious ways. This demonstrates that location does matter. It also demonstrates that key to this is management of location sensitivities. This is done by the recipient of calls who are, in one way or another, provided with ways of controlling intrusion.

This control is itself complex and is attested to by the fact that even those who know the recipient very well (and who may thus have a good idea of where that recipient might be), typically let the recipient make the decision as to what is an appropriate level of intrusion. This is allowed through the negotiations that commence a call, as already mentioned, or through the use of discrete connectivity media such as SMS again already mentioned.

An additional factor that has to be taken into account has to do with the fact that it is largely friends and family who are using their mobile phones to contact one another, and that even in business, mobiles are used for communicating with colleagues rather than with clients (a proposition examined earlier in this report in relation to social connectivity).

Given these two facts, then, there are two questions for LBS. Firstly, whom will be the party providing the service? If it is a business, rather than a consumer pull process, then a service provided by that party might meet with resistance. This is because the services may be more desirable to the business providing the services than to the customer they are hoping to reach.

Secondly, what relationship do the providers of LBS have to friends, family and colleagues? Are the users in control or, let us say, the operator? The implication is that if it is the business rather than the consumer, then this is not likely to be acceptable. In a phrase, it may be that business to consumer LBS will not succeed.

This is not to say that LBS is unlikely to develop; what it suggests is that for this to happen features of current practice need to be leveraged. This can occur once it is recognised, on the basis of the above findings, that there is a balance between need and social etiquette. Moreover, friends and family do have social structures that might support LBS: Parents want to locate children but children resist; teenagers want to locate other teenagers and parents but not let parents locate them. The issue, then, is not the need as it is already there: the issue is how to address the need.

5.4 Implications for UMTS Suppliers of LBS

The key dimensions of relevance for LBS, then, reflect subtleties in mobile communications behaviours, subtleties that can easily be overlooked (and indeed are by most of the suppliers in the market place). There is the fact that consumers find the idea of LBS worrying. Second, there is the fact that mobile usage is, nonetheless, saturated with location issues (from the users’ perspective): consumers orient to intrusion of public and-or private space through a usage ‘etiquette’ (e.g. texting at certain times and places). And finally there is the question of who is being connected with the mobile: currently it is close friends and family but not business to consumer.

The Study takes the view that the UMTS suppliers need to avoid presenting LBS to the consumer as somehow an abstract concept. If they do present it in this way they will meet with the consumer rejection. Instead they need to design “control for the recipient ” into LBS.

In particular they need to look at the ‘opening sequence’ of communications between users, showing an especial concern with how various types of messaging services are commenced with distinct but nonetheless rule bound opening sequences (by rules we mean the rules of social etiquette). The most important of these has to do with what is called (in the sociological literature) the ‘summons - answer sequence’, where a receiver of a call (i.e. the one summoned) has to respond in an appropriate manner. What is found with mobile communications and messaging in particular is how the summons - answer sequence is altered insofar as the recipient has more control over whether to respond and what to say in response than the summoner, i.e., the one making the call.

According to this view, LBS will have greater success if it allows users to opt for products and services on an expressly ‘need to have now’ basis. This might be according to time and place, and would be on an entirely ad hoc basis. Thus permission based products that require users to accept LBS as part of a complete unalterable package, (what might be called a ‘*carte blanche*’ approach), that is intended to secure customers through offering such things as tariff reductions for rental are, according to this view, unlikely to succeed, whatever the inducements. They would be perceived as a ‘step too far’.

Key to delivering such services is designing an appropriate MMI that provides the recipient control we have mentioned. Despite the evidence from the scientific research that the usability and appropriateness of the MMI is likely to be key, little consideration of usability factors would appear to have been given by suppliers of LBS services or indeed the operators who would provide data for those services. This it would seem is potentially dangerous neglect.

Irrespective of whether sufficient attention is given to the MMI, UMTS suppliers of LBS also need to design for social connectivity: for friends, family and colleagues. The evidence shows that services that succeed will support consumer to consumer and consumer to business and less so business to consumer services.

If suppliers fail to take the issue of who will use the services and the interface to the devices seriously—perhaps trying to design around them by making their services in such a fashion that matters of social etiquette are treated as subordinate to cost, for instance—then they will find, according to this analysis, that ‘doing’ LBS without looking at social factors will kill the opportunities that would appear to be there.

5.5 Interviews with experts: revisions of the implications

In general, the interviews with the expert panel confirmed these arguments. In particular there is a common recognition of the strong consumer suspicion about LBS and a need, therefore, to be very sensitive about their introduction.

Nonetheless, there were some dimensions along which there was much less consensus.

For example, though there was a general conviction that resistance can be overcome with the right incentive, particularly for permission-based LBS, but there was no agreement as to what this incentive might be.

In any case, the expert panel noted that there are so many types of LBS that counter examples could always be provided for any attempt to identify social shaping drivers beyond basic consumer suspicion. Indeed, the multiplicity of products makes production of a social shaping roadmap for LBS impractical.

5.6 Imaging and Mobile Phones

As with LBS, the concern with this topic was to inquire into whether imaging is a step too far. The data gathering and analytical process was the same as with LBS.

In summary, the Study found that consumers find the concept mysterious: they are not sure how to use it for communicating, and they are sensitive to loss of privacy. They are, however, excited by possibilities. Moreover, current behaviours show a willingness to adopt the new medium and new usage patterns, though for success in the longer term the analysis suggests that this new usage pattern should be similar to that related to text. These patterns of usage are more important than the fact that consumers like to use the mobile phone as a watch, radio, reminder etc. and therefore the imaging function might be an appealing add-on feature.

5.7 Findings

Most users find some appeal in mobile imaging, though they are confused as to whether the technology is to replace digital and SLR photography or is intended to create a new imaging genre that is additional to rather than substitutive of these technologies. Their preference, attested to in focus groups, survey data and direct observation, is to create a new genre, where imaging is used to play. Nonetheless, they are also aware that play has its limits, and that imaging can be used in socially undesirable ways.

More particularly, the focus groups identified a number of dimensions key to understanding the future social shaping of imaging. They are shown in figure 8 below.

Togetherness	Family and friends sharing moments
Novelty vs. Reality	Fun at the beginning and then get bored
Secrecy	Moral issues of taking covert pictures, possibility for abuse
Complexity & Quality	How difficult & how good will it be
Appropriateness	when it's not and when it is OK

Figure 8 Summary of concerns about imaging over mobile phones

Focusing on each in turn the Study found, with regard to togetherness and novelty, that the opportunities for using mobile imaging are quite exciting: *“You could take a picture and send it to your mate”*; or it could be used to say *“Look what you are missing out on”*, *“My sister would love it - she’s nine”*. Nonetheless, there was a concern that *“You’d get bored of taking pictures”*.

A paradox was perceived, however, and that had to do with appropriateness of the technology. The model users have is of an image quality that is as good as the more traditional photograph, i.e. one where the imaging quality would be very high. Thus attitudes to usage and costs associated with it reflect what was assumed to be the purpose of current photography and, given this, that there might be little fit with current usage motivation: *“Mobile phones are for day to day low level operation, photographs are for special occasions”*

A further concern had to do with the fact that cameras could be used to photograph people without their knowledge: a response often expressed to this concern was the suggestion that the mobile imaging device *“ must look like a camera”*. Potentially sinister usages

were not the only worry: there was also a concern that *“you could send an unsuitable image to your Mum by mistake”* (experience learned from text....!).

There was some expectation that incompatibility of mobiles and networks may cause difficulties sending photos to friends *“We’ve all bought Nokias so we can exchange photos - it doesn’t work if one of us has a Siemens”*. Many expressed the belief that a download facility to PC is needed to make it worthwhile. This reflected a concern about inadequate size of screen and a problem of where to store the images.

5.8 Current patterns of use

Unlike LBS there is no social etiquette for taking and sending instant pictures with mobile imaging (though there clearly is already one for taking photos). This leads to a question as to how imaging products could be used: Subjects asked themselves when they would use it and were unsure. They were also concerned with what they viewed as the practicalities, which they viewed as insurmountable. Partly this had to do with the model of a similar technology they had in mind, where cost was known to be high and technology challenging. (What they are were thinking of here is both SLR and digital photography). If the model being used mirrors the one used with these more traditional technologies, then subjects raised concerns about quality and size of the image with mobiles, which they viewed as being poor on both counts. Even so the idea was indeed appealing: for recording special family moments or proof of an event *“I saw Jude Law in Covent Garden but no-one believed me”*.

5.9 Implications for UMTS suppliers of Imaging

Imaging over mobile phones is in its infancy but imaging (camera, cinema, video etc) has an historic legacy in peoples’ day to day lives that is influencing their willingness to adopt imaging as an augmentation to a mobile phone. However, the novelty and complexity of imaging over mobile phones at the current time clouds various issues to do with what this process of augmentation will lead to.

For example, people are concerned about such things as appropriateness: *“Is this really what a mobile phone is for?”*

They are also worried about secrecy: *“Who has taken a picture of me (my child, my innovative design) and what are they using doing with the image?”*

Products that assuage these fears will succeed only if they can shape consumer expectations in a certain way. Given that phone imaging is still in its infancy, the suppliers still have the opportunity to make sure that this is the direction that social shaping takes.

More particularly, according to this analysis, suppliers need to show how mobile phone images are for friendly, ‘in the moment’ and largely ephemeral communicating and not for replacing 35mm or digital photos which provide lasting memories. In a phrase, they are not for ceremony but for pictures to play with.

This means that suppliers need to put effort into managing down expectations for quality and storage of images amongst consumers. A model could be text, and so the products should be encouraged to be used like that medium, which means as additional to such things as the traditional post card and digital camera image of special events. According to this vision, the goal would be to support visual ‘chitchat’ not wedding photography type of memorabilia.

5.10 Video telephony

If this is the case for imaging, the issues as regards the social shaping of video telephony

are much more substantial.

The evidence shows that users need to be able to solve the problem of managing intrusion with fully two way video. Only through embedding extensive recipient control in to the devices themselves will video telephony find acceptance. This will require new MMIs and form factors. Failure to do so will lead to resistance from users.

For example, video telephony will not be acceptable except for a small proportion of users if there is no capacity for the recipient to negotiate the choice of video, talk or text at commencement of each communication. This has to do with what was remarked upon earlier regarding the need to ensure recipient control.

This control has a number of salient aspects: one is that a video caller should not be able to switch on the camera at the recipient's end; rather it is only the recipient that should be able to do this. But currently the way that most networks and terminals are being designed to work , a video call is either 'go or no go' with no capacity to start with talk and then move up to video and people might want to change after an initial hesitation (though some operators are beginning to alter this).

Similarly, a camera should routinely be facing away from the recipient rather than towards, so that they can more effectively control what is being seen. There is evidence that recipients are more likely to show what they can see (i.e. what they are looking at) than let the caller see their faces. This has in part to do with concern about what a camera might see when placed close to the ear and so on. Hands free solutions to this dilemma are likely to be dismissed since they seem to create further problems of managing the public and the private with many subjects expressing a fear that with hands free it becomes more difficult to ensure privacy. To achieve these requirements would necessitate quite substantial changes in the MMI and form factor of devices and these are not currently planned by terminal manufacturers nor required by network operators.

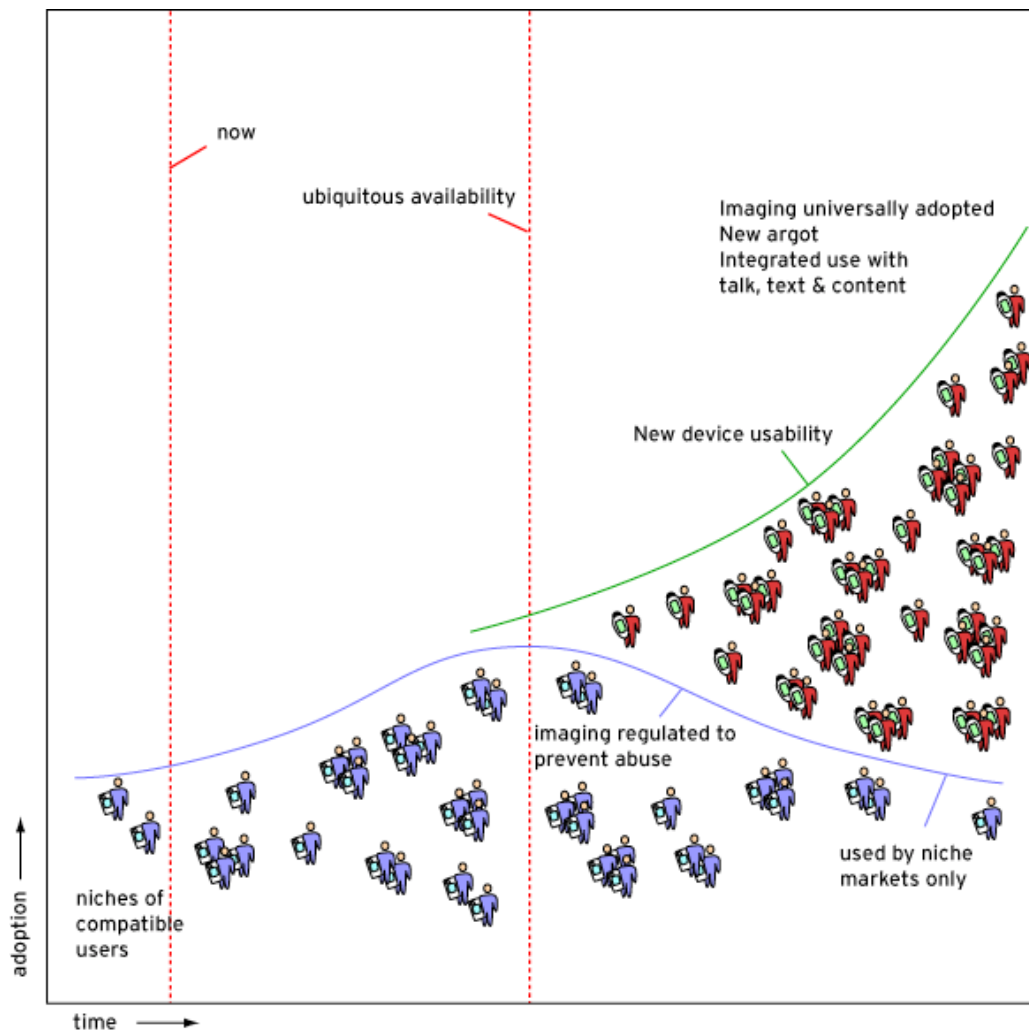
5.11 Interviews with experts: imaging and video

Unlike the case with LBS, there was almost complete consensus about the implications for the evolution of UMTS imaging services with the expert panel.

First, there was a consensus as regards imaging as being an application suited for 'play' rather than for serious or as it were practical functions. It will thus flourish in the way that text has. It was also agreed that managing consumers' expectation about the quality and role of imaging will need to be handled carefully, however, if this is to be ensured.

As regards video telephony, there was consensus that there will need to be a substantial shift in levels of usability for imaging technologies to become more than niche products. Those described above as regards the MMI, the direction of the camera and so on were all understood and agreed with by the panel. However, there was consensus that insufficient investment was being made to deliver these changes.

Figure 9: The Roadmap for Social Shaping of Imaging



Explanation

Currently, imaging is only possible between groups of niche users. Without substantial change in MMI, particularly for video telephony, however, there is a strong possibility recognised throughout the industry and the scientific world that regulatory resistance may show itself: and if it does not then certainly the technology may end up being confined to a small group of users. With changes in the MMI substantially more users will adopt the technology.

6 Conclusion

The purpose of this investigation has been to explore whether social shaping factors will affect the take-up of UMTS products and services. It was undertaken in the belief that such factors have shaped other technologies and are therefore likely to do the same with UMTS. The outcome of the research is clear evidence that such factors will.

These factors will take many forms and are often interconnected with technological drivers as well as each other. This investigation has not looked at them all however, but has chosen to focus on three in particular.

The last we have documented, namely the ways in which what is public and private is changing social etiquette and how these may lead to a push back effect, is the most contentious. In the case of locationbased services (LBS), contention arises because of the fact that there is a clear tension amongst users as regards what the cost benefits of using such applications might be. These benefits have very little to do with financial matters and much more to do with the social costs of their use. All operators and providers of such services must recognise therefore that financial cost incentives may have little impact or indeed relevance to the success of LBS. Ensuring the recipients of these services have complete control of the applications is much more important, but currently little effort has been put into investigating how this would be attained. Without more effort being put in to this issue, LBS may indeed lead to user or even regulatory resistance.

Imaging, meanwhile, is contentious for altogether different reasons: it is already big business for the manufacturers and operators and thus it is already being shaped by users' expectations and demands. Nevertheless, this research clearly demonstrates how this shaping will occur and how suppliers of imaging products and services need to address that shaping and ensure that there is a close fit between users' desires and technological possibility. Key to this is the recognition that imaging is for play and not for functional purposes. Fully understanding the implications of this is not so easy, and there is a likelihood that a vain hope that imaging will be used for business will emerge. This is extremely unlikely and in any case would distract from efforts to fully exploit images for play. Moreover, play itself has peculiar properties, such as novelty value, and this goes some way to explaining the declining rates of image usage once an initial period of novelty wear off. But it also means that new forms of play—quite literally new games—will create their own popularity. Here terminals and operators need to ensure that their technologies enable 3rd parties to create these games, whatever they might be.

Irrespective of this, there is unlikely to be any point at which imaging creates user resistance. In contrast, video telephony may well create such a push back. To be acceptable to users, very substantive investment in new form factors and MMIs will be required to ensure that video telephony is not a step too far. The evidence indicates that these investments are not being made. This would appear to be because there is still insufficient recognition of the importance of social shaping in this area.

The other two themes, namely the extent to which users have an emotional relationship with their mobile device, and the kind of social connections that are sustained through the technology, have their own distinct implications for UMTS.

The research on social connectivity highlights the fact that GSM has increased the frequency of social contact but not the breadth. This suggests that new ways of sustaining this social connectivity should be developed which provide additional means of keeping in touch. It also suggests that users will be willing to pay for such services since the social value it provides them is great. In contrast, other services, such as m-commerce, may be much more price sensitive since their value will not be measured so positively. In this sense, GSM has in effect been a technology that has allowed people to be in touch with

each other, any time and place and has thus allowed what was earlier called personal telephony. The fact that this was provided by mobile networks and terminals is immaterial to the user. UMTS will be primarily used for the same. This has all sorts of implications about the difficulty of getting users to do more than stay in touch with friends and family, for example and the problem of getting to leverage the opportunities for information use that many hope UMTS will enable.

Similarly with emotion. Here there can be no doubt that users do indeed have a special relationship with their mobile, one that makes it quite different from the relationship they have with other devices. The mobile phone is a primary weapon in their arsenal for sustaining their emotional lives. The success of GSM in achieving this has had a number of roots.

One has to do with the size of GSM devices: their relative smallness has meant that they can be used with one hand and in places where, in many respects, it would seem inappropriate, such as when driving. But this very ubiquity and ease of use is key to the value that users relish. It means that there is no handicap in exercising their emotional needs. They talk when they need to, they listen when they have to. Attempts to move away from the form factor that has succeeded for GSM may therefore assault these values and diminish the emotional utility of the technology. Paradoxically, there is considerable pressure to make such a move so as to enable more information based activities on the part of the users: smart phones, which effectively adopt the PDA form, are a case in point and their relative failure in the market place may be an indication of resistance to a shift in form factor in the longer term.

Costs too are important. The evidence shows that costs allocated to sustaining emotional lives will be relatively speaking cost inelastic. The need is so great that the financial cost does not in effect matter. In contrast, the cost of activities that do not deliver emotional value, for example for accessing information about companies and such like—the kind of information that the web is used for—may be much more cost sensitive. In this regard, UMTS suppliers need to exploit people's emotional needs and lives and give rather less attention to delivering information content that has little emotional value. Many suppliers recognise this.

Unfortunately, their success at doing this is not guaranteed and indeed is doubtful. The reasons for this are not to do with a lack of understanding of the importance of emotion, or social connectivity or the thresholds beyond which public and private behaviours cannot go. The experts who were interviewed as part of the research demonstrated considerable knowledge about these and other social shaping factors. Moreover, their knowledge more or less mirrored what the research found, albeit that there were minor differences in interpretation.

Much more importantly however, these experts stated again and again that there is insufficient understanding of social shaping issues throughout their organisations. Consequently, decisions about future products and services are still being made without due recognition of how users will shape demand. It is then still true to say that UMTS is a technology driven rather than user driven technology.

Nevertheless, one of the key benefits of undertaking this research is not only to document and illustrate how social shaping will effect UMTS, but to help facilitate sharing of knowledge about social shaping in the UMTS supplier community. Hitherto, those within this community who have recognised the need to deal with social factors have been unheard or given too little influence. With this report, the expectation is that these individuals will now be listened to more carefully. The views of the general scientific community, much of whose research has been reported here, will also get a better hearing. If this is so, then this research will have also have delivered on the goals of the UMTS

forum: to help ensure that those organisations who wish to participate in the commercial space enabled by UMTS will succeed.

7 Appendix 1: Glossary of terms

AMPS – 1st generation GSM mobile phone technology
B2C – Business to Consumer
C2C – Consumer to Consumer
C2B – Consumer to Business
DWRC – Digital World Research Centre at the University of Surrey
Flanerie – behaviours of people
ICT – information communication technology
LBS – Location Based Services
GSM – 2nd generation mobile communications service Global System for Mobile Communications
MMI—Man Machine Interface
NMT – 1st generation analogue mobile phone technology (Nordic Mobile Telecommunications)
Person to Person – communications conducted between people
Social etiquette – familiar and socially acceptable behaviours
Person to Information – communications conducted between people and information sources
TACS – 1st generation analogue mobile phone technology (Total access communications service)
Taxonomy – history
UMTS – Universal Mobile Telecommunications Service