Mobility and Connectivity

Trends, drivers and solutions

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This research and discussion report, which was commissioned by T-Mobile, is based on the output from three online surveys and a series of associated workshops conducted by Freeform Dynamics Ltd in the second and third quarters of 2007.

The Internet is driving mobility

During the middle part of 2007, Freeform Dynamics ran a series of Web based surveys looking at the technology trends that impact mobile behaviour, and specifically what business users are looking for in terms of mobile devices and service combinations. There were three surveys in total:

1. How organisations are approaching mobile service provision (1143 respondents)
2. Collaboration trends and their impact on mobility (1457 respondents)
3. Expectations of mobility solutions over the short to medium term (694 respondents)

In addition, a number of mobility questions were included in our September 2007 barometer survey. These surveys together give us a good idea of what's driving mobility-related plans and activity across Europe, in the USA and elsewhere, and in this report we collate some of the highlights

It is probably worth noting that the main sections of the report were originally written as stand-alone articles for online publication. We have pulled these together and tweaked them to 'smooth' the flow, but have tried to preserve the integrity and spirit of each individual article. We hope you enjoy the less formal writing style, but also ask you to forgive any joins that may be still apparent.

We should also note that the 'self-selecting' nature of Web based surveys used as the foundation for the report means the samples will be biased towards those with knowledge of or interest in mobility, and absolute percentages will reflect this. Please therefore be careful about taking the numbers too literally. As we shall see, however, the limitations do not prevent us from generating some great insights from relative contrasts and comparisons.
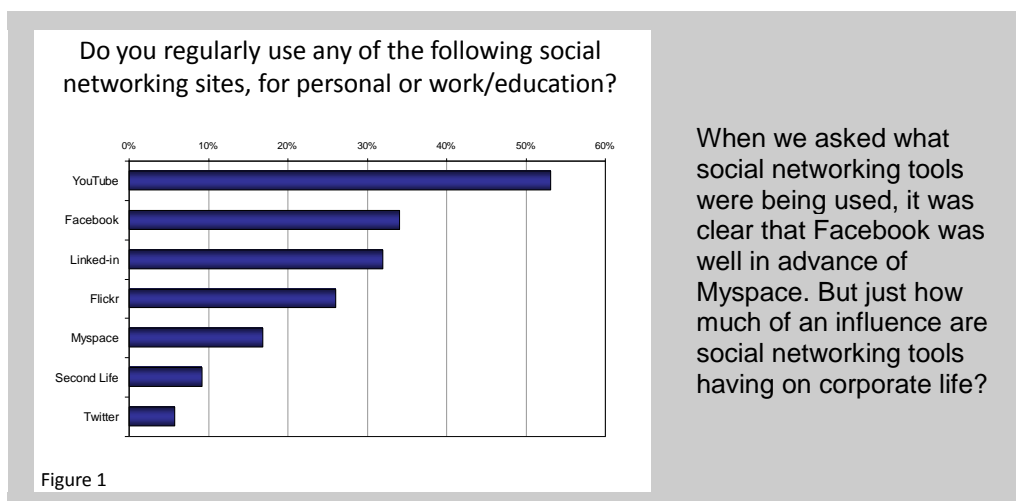
So let's begin with some context and a general look at the way we communicate with each other, which is increasingly leading us into the general domain of 'social networking'.

Social networking and corporate life

We have the Internet to thank for a veritable smörgåsbord of communications and collaboration technologies, each of which is having its own impact on both personal and corporate behaviour. Email may be dominant but it is only one of many mechanisms, from SMS on mobile phones to the newer kids on the online block, such as blogs and social sites. Without dwelling on the specifics, let's take a look at just how much of an impact such tools are having.

Over the past two or three years, zanily named social networking tools such as Facebook, LinkedIn, MySpace, Flickr and Twitter have come from nowhere to wheedle their way into just about every aspect of online life, both in business and pleasure. Such facilities share a handful of simple, but powerful core features: each enables information sharing of some form, has some kind of community orientation and will be constructed in a way that several of the blighters can be merged (or should we say, "mashed up") into clever, multifaceted concoctions of collaborative capability.

From the research we found that there was significant use of such tools across the board. Apart from the conclusion from Figure 1 that YouTube should be getting worried by the rise of Facebook, there can be no doubt about how important these tools are in the lives of many of our respondents.

Figure 1

When we asked what social networking tools were being used, it was clear that Facebook was well in advance of Myspace. But just how much of an influence are social networking tools having on corporate life?
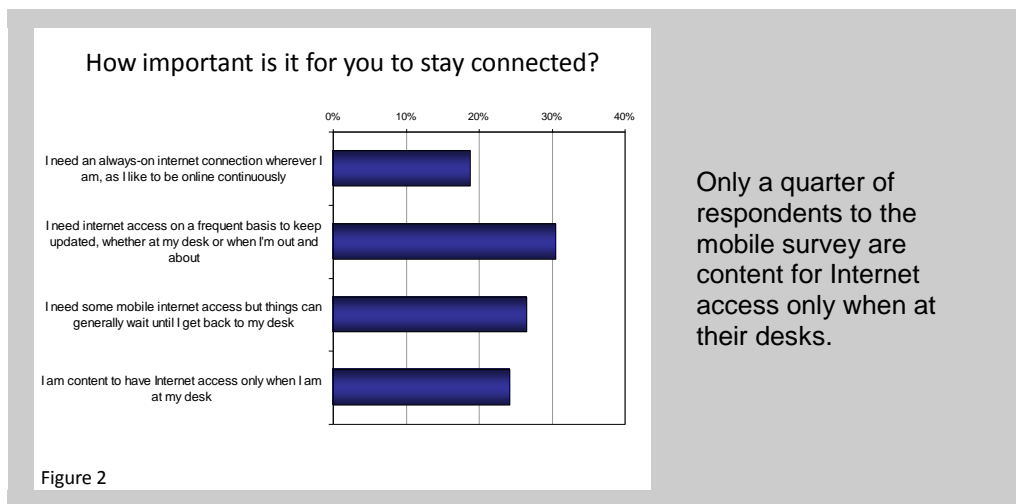
If we look just in terms of business usage, the picture becomes very different. We see an order of magnitude difference in their use in business versus pleasure – with the exception of LinkedIn, which is seen as a business tool in itself. For this reason alone, whatever the pundits are saying, this casts serious doubt on the current relevance of (say) Facebook as a valid element of the business environment. Bluntly – if your staff are on Facebook, chances are they're interacting with their mates.

Without dwelling too long on the pros and cons of social networking, it's fair to say that trends such as these are catalysing a general desire to communicate and collaborate. From a mobility perspective, this is driving beyond SMS and voice calls and towards more interactive, web-based mechanisms. There's also the youth factor - the kids of today may not have invented collaboration and indeed, some very successful businesses were set up with nary more than paper and pen, never mind the telephone. However as the younger generations of today become the business-leaders of tomorrow, their habits will have a clear impact on business behaviour.

The collaboration impact on connectivity

No doubt the debate around social networking tools will run and run, and we shall eventually arrive at a happy medium where such tools become part of the business fabric. From the connectivity perspective, the question becomes: given the increasing range of tools and technologies available to us that require some kind of Internet connection, just how important is it for us to stay connected?

From the research, the answer to this question is telling. Even with the mobile-friendly caveat, as shown in Figure 2 the number is high: almost exactly 50% of respondents told us they need to have some kind of connection wherever they are. Of these, nearly 20% claim to need an always-on connection to support their collaboration habit. Even, if we consider the worst case scenario, where only people with any interest at all in online collaboration capabilities participated in the study, that's still quite a proportion.

How important is it for you to stay connected?

Only a quarter of respondents to the mobile survey are content for Internet access only when at their desks.

Figure 2

There are several potential explanations for this. It could be argued that collaboration is of direct benefit for business reasons, and therefore, this is all about people being able to do their jobs better. As noted above however, the evidence suggests that much use of such tools is for pleasure alone (that is, if receiving a Facebook message that claims to constitute a tequila sunrise can be categorised as "pleasure").

The productivity angle is worth debating – not least because the social aspects of the business environment are a factor. Anecdotal evidence suggests home and remote workers miss out on the 'water cooler' experiences of their head office colleagues, so could it be that social networking tools fill a necessary gap? Might it also be that as people become accustomed to such a diet of information, they could suffer some kind of withdrawal if it was taken away?

We don't have a direct answer to that question from the research, but it's worth keeping in mind, particularly if we consider the constituency that is most affected. The 'always-on' average might be 19% but in the sub-25 age group, the figure rises to 27%. As the figure stays pretty constant above

25, age is clearly an important factor; note also that the overall percentage for people that need more frequent Internet access remains relatively constant across the age ranges, at about 50%. Within this group we are seeing a generation forming, whose habits are based on the existence of collaborative technology. Not all are choosing to adopt it, but for a growing contingent of young people certainly, switching off is not an option.

Mobility has become part of the business fabric

So, from an individual perspective we are seeing that people are increasing their personal and business 'presence', and mobile technologies are becoming a pre-requisite for many to enable such capability. Just how much of a concern is mobile connectivity to the corporation itself? The fear might be, for example, that the individual desire to get mobile does not map onto a corporate will to benefit from said mobility.

From the research data we can quash such fears, fortunately. As we can see from Figure 3, less than 20% of respondents claimed their organisations operated in a more static way, and had little need for mobile services. Such capabilities are certainly not just for the minority. At the other end of the scale, roughly a quarter of respondents saw their organisations as 'highly mobile'. So, how mobile services are delivered, is going to have a significant impact on a large number of organisations.

Which of the following best describes the nature of the workforce in your organisation?

More than 80% of all organisations today have some kind of mobile workforce.

Figure 3

We are also seeing a direct impact on corporate initiatives. Indeed, according to our research, initiatives for mobile and remote access ranked third out of a total of 21 potential activities, with 60% of respondents saying their organisations were planning to roll out such technologies within the next six months. Ranking above mobility were only infrastructure optimisation and custom application development.

This is fascinating, particularly if we compare it to some of the other initiatives that were offered to respondents in the survey in a list of 25 or more. Consider green computing for example, which ranked 19th with less than 20% of respondents planning some kind of activity. Lower still were social computing (which puts paid to the corporate Facebook idea) and software as a service.
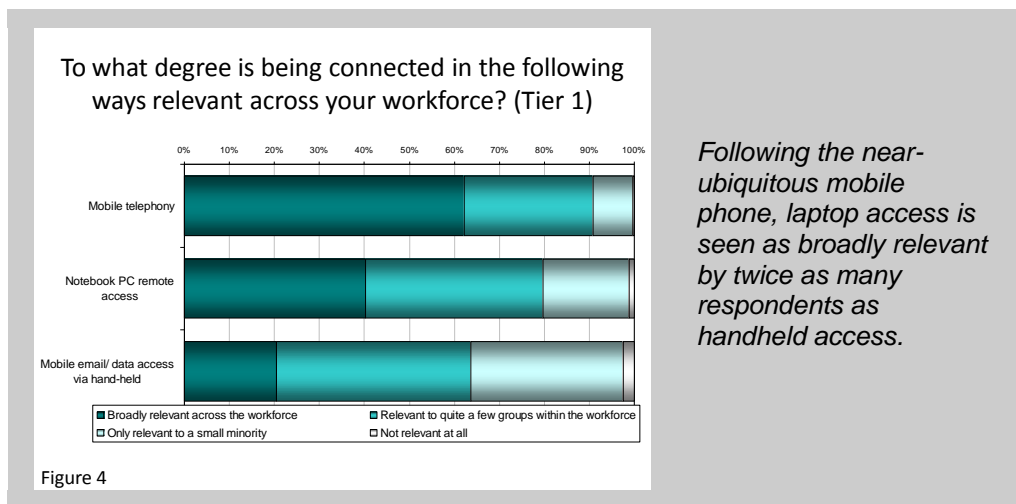
Notice that mobile access was ranked third overall for all sizes of organisation. It maintained this position for mid market companies, while for the largest organisations, mobility was pushed into fourth position by governance, compliance and risk related initiatives – a set of activities that bigger companies need to do, whether they want to or not. For smaller companies, it was the development of a Web presence that pipped mobility to the third post.

The importance of mobility is an interesting one, particularly as for many vertical sectors, it can't be linked directly to cost savings – perhaps the only place that this applies is in customer oriented, "man with a van" scenarios such as logistics or maintenance servicing. Otherwise, and as we have seen elsewhere in our recent polls, mobile application use tends to be more "value based" – that is, it has a direct cost, and a less measurable, indirect set of benefits. Kitting project managers with Blackberries may not be making the company money, for example, but it is generally seen as beneficial.

While both mobile access and online collaboration technologies are on the rise, it is not yet the norm to assume their presence. For example, should you be late for a meeting, it is not guaranteed that you can email one of the other participants to let them know; however it is generally acceptable to consider sending them an SMS. From the research quoted in this report, we expect to see mobility and collaboration to shadow and feed each other: better mobility supports better collaboration, and vice versa.

The laptop computer is the preferred mobility device

When looking at the research findings, it is no surprise that the mobile phone is seen as a dominant device by mobile workers, which has achieved near-complete penetration at least for certain scenarios. What we found more interesting was how, for larger organisations, remote access from a laptop computer was about twice as likely to be broadly relevant across the workforce, compared to mobile access via a handheld device. The figure below shows this for Tier 1 organisations of greater than 5,000 employees, but the proportions are the same for organisations with 1,000 employees or more. This distinction is less profound, but still true in smaller of companies.

Figure 4

Following the near-ubiquitous mobile phone, laptop access is seen as broadly relevant by twice as many respondents as handheld access.

Why exactly is this? There are a number of potential reasons. It may be for example, that mobile email is no longer an adequate support for a remotely accessible corporate presence. A couple of years ago, email was very much the dominant mobile application, the rapid rise of the Blackberry being symptomatic of the convergence of two factors – demand for email, and broader availability of an appropriate access device. Many organisations cut their teeth on mobile email, and maybe they have now moved on to needing access to a wider pool of applications.
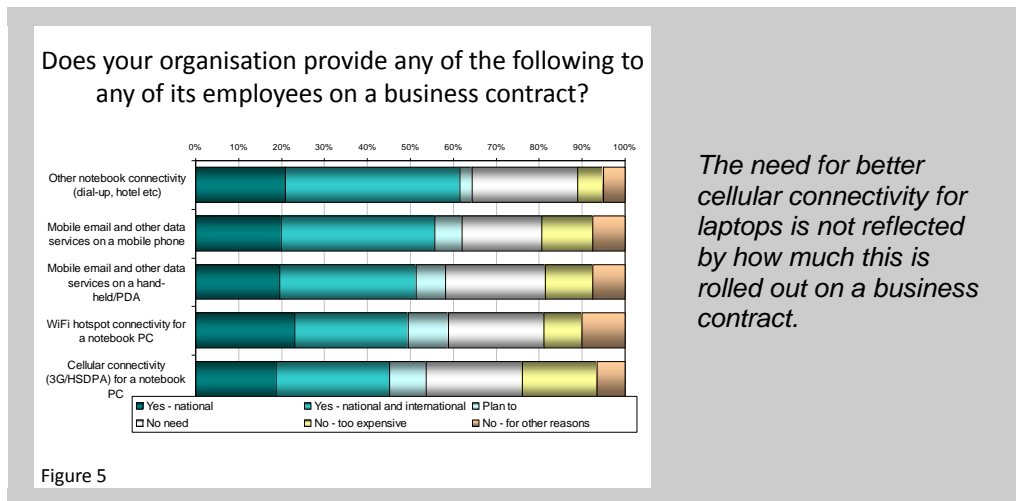
There is also the question of form factor. "I want a phone to phone" said one of our respondents, "and a [laptop with a] keyboard I can type using both hands," said another. Laptops offer a far wider range of office-standard applications, so from the point of view of remote productivity, for many the laptop will be the only choice.

Finally, it may also be the case that the majority of people who need laptops these days have them, lessening the need for handheld connectivity. This more innocuous explanation is more about the pervasiveness of technology, than any particular advantages of one solution over another. Organisations may be more likely to fund PC's for their workforce than handhelds, or equally, perhaps the expectation is increasingly that individuals provide their own technology, which could have an impact on the uptake of both notebooks and handheld devices.

This last point is not just a shot in the dark. Increasingly, we are hearing how companies expect their employees to provide their own devices – not just handhelds but notebook computers (we could cite at least one major corporate that has taken this line). This has an obvious impact on how devices are managed, as well as on aspects such as security and the more general business risk. As we were told by one respondent, "The danger is that computers often need to meet quite specific criteria to be suitable for corporate use." The verdict is still open: "It's yet another boneheaded bean-counter, money-saving brainstorm," said another. Only time will tell.

While laptops are the dominant device for remote access, it is interesting to note that this requirement is not reflected in how wireless services are rolled out to laptop users. As shown in

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Figure 5, wireless or cellular access contracts are rolled out less often for notebooks than for handhelds. The fact that laptops are used by teleworkers at home is only part of the answer, as we have seen elsewhere in the research; anecdotal evidence also suggests "psychological bundling" of cellular services exists more with PDAs than with laptops. This is partially for historical reasons; meanwhile, the chart shows how cost is an important criterion for denying cellular access.

The need for better cellular connectivity for laptops is not reflected by how much this is rolled out on a business contract.

Figure 5

We can see further evidence for this when we drill down into "mobility power users" – individuals that have access to top grade equipment and know how to use it. Once again, there are significant differences depending on demographic – so, while overall, the preferred mechanism for mobile collaboration is using a notebook PC in a wireless hotspot, under-25's are expressing a preference for handheld devices for access to discussion boards and other collaborative applications. As are the broader set of respondents whose corporate kit is much better than their own, personal kit –it could be, quite simply, that people with the best kit are more likely to access a broader range of online facilities.

Meanwhile, and unsurprisingly perhaps, the different form factors will require different combinations of services. Let's take a look at these.

Different form factors require different service combinations

While the laptop may be preferred, respondents are not restricting themselves to a single device. There is a distinct division into two 'camps' – those seeing the laptop as the primary remote access device, and those who preferred a handheld device for the majority of their activity. This could be for reasons of user provenance – once a computer user, always a computer user and vice versa – or equally, it could be down to usage scenarios. Perhaps road warriors, sales execs and service engineers only have minutes to grab those messages and move on, whereas roving project managers can afford a more sedentary (though no less important, we hasten to add) existence.

Whatever the historical background, we used these two groupings to determine how service combinations could vary. Taking the notebook users first, virtually all (95%) specified some kind of need for mobile access. Perhaps those that weren't that interested in remote laptop access may have been less inclined to fill in the survey, but of this proportion however, about a quarter indicated they were quite happy with their cellular-only access, and a slightly smaller proportion said they were content with WiFi connectivity from hotspots alone. With barely a pause to note the implication – that high-speed cellular access is ahead of WiFi in the stakes – it doesn't take a mathematician to surmise that the remainder, roughly half, see both cellular and WiFi access as required elements in the ideal mobile package.

Meanwhile, we have the handheld community. For this group the difference between "single-mode" and "dual-mode" users were even more pronounced – respondents requiring only one kind of access amounted to less than 30%, meaning that over two thirds desire some combination of functions. Of these:
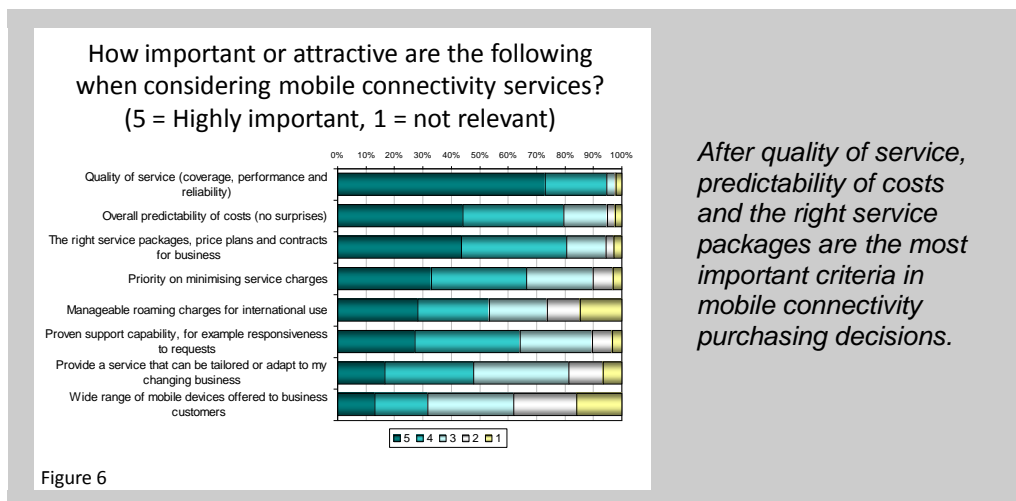
- 16% wanted to use mobile data services on the handheld, and have WiFi for their notebook
- 16% wanted to use mobile data on the handheld, *and* have cellular access for the notebook
- 29% wanted all three – handheld data services, and cellular/WiFi on the notebook.

What this tells us is that there's a clear need to combine WiFi, cellular and mobile data services into a single service package. It's no fun trying to manage multiple service contracts, support arrangements and invoicing/billing mechanisms. Indeed, many of our respondents pointed out that while combining such features into a single device was possible, the ability to offer such services as a single package was holding things back.

Predictability drives purchasing in mobile connectivity

This leads us to the broader question of how mobile services are procured. What is it that directs how we buy mobile services for our business today? According to survey respondents, the first criterion chosen was service quality, which should come as no surprise for mobile, where poor quality can quickly equate to no service at all.

The second and third criteria involve the availability of the right service packages, and the overall ability to predict costs. The keyword in both cases is predictability – as businesses we want to be able to plan for, and subsequently buy a package that fits our needs, at a cost we can understand and expect. As we can see in Figure 6, these criteria are seen as more important than minimising service charges. If we expect to pay a thousand pounds per month for a single user's access then at least we will be unsurprised; if, however we believe that we should be paying 200 pounds and the bill comes to 600, then we have every right to be horrified. *What* we pay is considered to be less important in the buying process than *knowing* what we pay.

Figure 6

After quality of service, predictability of costs and the right service packages are the most important criteria in mobile connectivity purchasing decisions.

This makes sense: in general, organisations have to plan a year ahead (the length of the usual contract) so as long as costs remain within budget, additional cost management incentives are the icing, rather than the cake. The cherry on the top is the handheld device itself – while most would love to get the sexiest, smallest, most capable device on the market, it's the thing we're most prepared to compromise on.

While the proportions may change between sizes of organisation, there are remarkably little differences in priorities when it comes to purchasing mobile services. Indeed, the only factor that shows any significant difference is the need for a proven support capability which larger (5000-plus) organisations put third after predictability, pushing costs down still further.

It's not that costs are unimportant, obviously – more that they are seen as subordinate to predictability. And nowhere do the two sides come together more obviously, than when we consider mobile roaming.

Mobile Roaming – just a large business issue?

If there is one topic that is guaranteed to raise the blood pressure of the average corporate telecoms manager, it's mobile roaming charges. The level of fees imposed by mobile operators on customers making or receiving calls when travelling internationally has been a bone of contention for many years. When talking about emotive topics like this, however, it is always difficult to ascertain exactly how many organisations are affected.

In the figure above, one of the responses concerned the importance of operators offering "Manageable roaming charges for international use." If we assume that those giving a response of four or five on the above scale care significantly about roaming, the results tell us that on average, continental Europeans care the most (63 per cent), closely followed by Brits (56 per cent), then Americans (39 per cent). This big difference between Americans and Europeans undoubtedly highlights the fact that many businesses in the US have such a large home market that there really is little incentive to look elsewhere, and hence travelling internationally on business is not something they do quite as much.

Drilling into the data, we actually see that large American companies with greater than 5,000 employees are not that different to Europeans, with 54 per cent of them caring about roaming, compared to just 32 per cent for smaller US organisations. Tellingly, the difference between larger and smaller businesses we see in the US is much less evident in Europe, where those who care about roaming stand at 61 per cent and 55 per cent respectively for corporates versus smaller businesses. This is consistent with smaller home markets driving a greater level of international business mobility, which is in turn enabled by the relatively low cost of international travel within Europe – whether by planes, trains or automobiles.

This finding also blows the theory that international roaming is mostly a large enterprise requirement completely out of the water, in Europe at least, meaning European operators should really be paying as much attention to the roaming element in small business service propositions as they do in the enterprise space.

Thankfully, most of the mobile operators seem to be making efforts with regard to roaming, which has led to the emergence of a number of different schemes and packages that take at least some of the pain away. It's not yet perfect by any means, but with the occasional nudge from the EU, the situation within Europe, for example, is moving from "extortionate and totally unpredictable" to "expensive but manageable".

As a word of caution, however, there are two aspects to roaming that can easily catch you out. The first is travelling between the US and Europe, as the deals and relationships between operators across the pond are generally not as advanced as those within Europe. The second potential gotcha is roaming charges in relation to mobile data access, where arrangements between operators are even less advanced than in the voice arena. Here, it is important to pay particular attention to the transatlantic situation as some UK operators, for example, will charge up to £10 per megabyte. One way of dealing with this for notebook PC users is to look for services that bundle cellular and WiFi access, which gives us another driver towards the requirement for service packages that incorporate both cellular and WiFi services.

The bottom line is that while things are getting better, it is still easy to get caught out. On the other hand, it is also true that excessive charges can be avoided in many cases through a combination of understanding how it all works within your contract and putting the necessary usage policies in place.

The future: the personal communications hub

We can put all of the above into the pot to give us an insight into how things stand now. Equally, the technologies and services provided need to take into account what organisations and individuals might want to see. We can consider this from two perspectives – one is to take more of a "blue sky" view which considers an ideal future, and the second is the more pragmatic future which builds on what we have today.

From a device perspective for example, the respondents to our polls would prefer to consolidate their requirements onto a single device which could then act as a "hub" for all texts, emails, chats and voice calls. When we asked about the importance of having such a communications hub, over 60% responded that it would be highly desirable or desirable. But just how practical is this?

One thing we didn't specify was the type of device. As we have already seen, at various times in the survey series, respondents repeatedly posited the laptop as the primary mobile tool. However, there are going to be plenty of contexts (hotel, train, top of a mountain) where it's just not going to be practical to be carrying around a computer, however ultra-thin and portable they become.
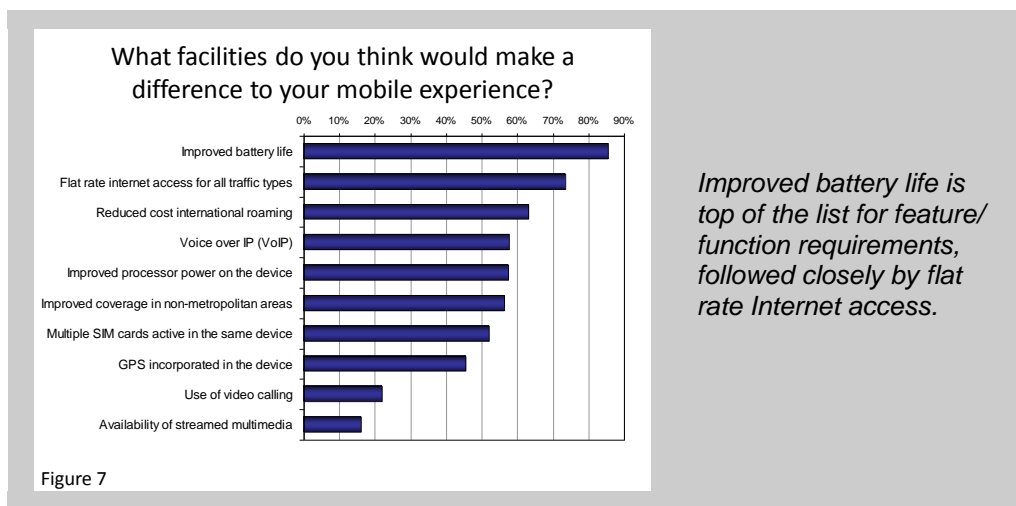
Instead, this will be more about ensuring that we can take our communications profile with us wherever we go, regardless of what we choose to put into our pocket or bag. There can't be one size that fits all profiles: not only do habits vary, but also we like to communicate in different ways

with different people, depending on what context we're in. Some situations require a simple, terse voice call for example, or a quick email exchange; others may involve a group chat, video or indeed shared presentations and screens, for example using tools from Cisco/WebEx, Adobe or Citrix.

While this last scenario may not yet illustrate de facto mobile behaviour, such behaviours are becoming more prevalent on the desktop, and it's fair to surmise that the mobile equivalents will follow. As smart-phones become more powerful they will no doubt take on some of this workload, but for the foreseeable future we shall still need to select the most appropriate device for the job – and associate our connectivity with it as simply as possible.

Whatever the device that sits between the connection pipes and the person, it'll need to be capable of managing a whole set of different information flows, voice and data. Not only this but, based on what we have already seen in this study about planning ahead in terms of connectivity costs and single-billing, service providers will need to ensure they deliver appropriate tariffs to support the differing needs of their subscriber base, regardless of what sits at the end of the pipe.

Given the importance of bringing together their differing communications onto whatever device they choose, what are the implications for devices themselves? Rather than considering form factors, we asked what features and functions would make the package most attractive. In Figure 7 we see the view of business users, but there's a similar picture for personal usage:

What facilities do you think would make a difference to your mobile experience?

Improved battery life is top of the list for feature/ function requirements, followed closely by flat rate Internet access.

Figure 7

Top of the list we see the "improved battery life" – implying that, given all of the potential improvements that could be made, it is the most mundane requirement that holds us back the most. It's funny, isn't it: technology has advanced so far, and yet, for all the talk of light bulbs that draw power at a distance, or fuel cells that run on lighter gas, we are still slaves to the power supply.

Fortunately, not all requirements are quite as insurmountable. A close second in the priority list is flat rate Internet access, which is a feature of a number of service packages available today: for reasons we've seen elsewhere in this report, such as predictability of costs and convergence of functions, this is clearly something that would make people's lives easier. Given the amount of fuss about international roaming at the moment, it's interesting to see that it comes in only third for business users (and fifth for personal users, for that matter).

While these topics are being addressed, it will be interesting to see what manufacturers - particularly laptop vendors - can come up with to give us more power to our fingertips. Initiatives such as One Laptop Per Child (OLPC), with its reduced-functionality, low-power mode of operation illustrate the potential for innovation in this area.

Towards Always On Mobile Internet

Meanwhile however, all of this begs the question – will it make any difference? If we were armed with devices that gave us constant connectivity with the wider Internet, would it really make any difference to how we lived and worked?

The answer is a resounding 'yes', according to respondents. As shown in Figure 8, less than 15% saw this as a negative proposition. Indeed, and more importantly, over half of respondents stated that always-on mobile Internet access would become fundamental to how they worked.
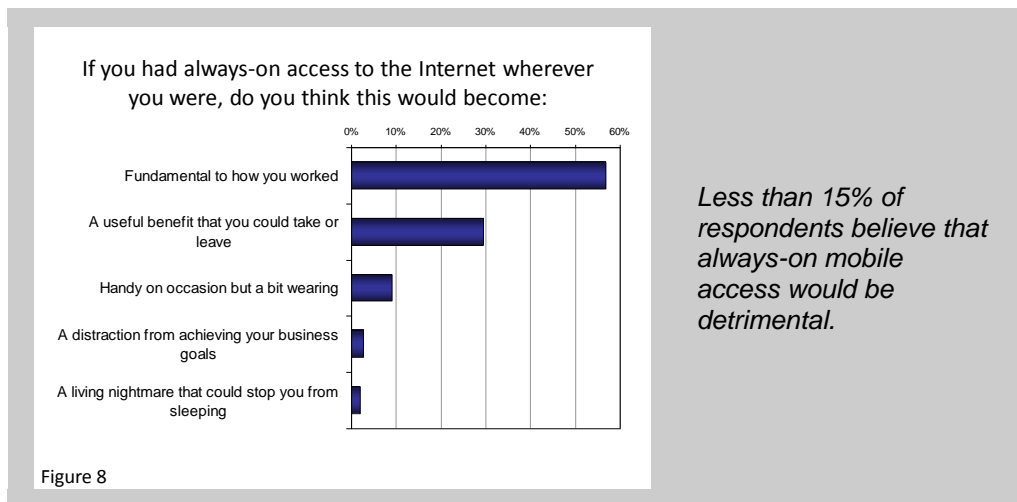
Less than 15% of respondents believe that always-on mobile access would be detrimental.

Figure 8

That's quite a finding, despite respondents being likely to have a general interest in mobility. Indeed, if we drill into the data, we see that respondents with better kit are more likely to answer "fundamental" than those who just get by. Even given this skew, we know from previous iterations of the research that only about 18% of respondents consider themselves as mobile power users. The delta between the two figures suggests a latent demand for full-fat mobile Internet access, whenever and wherever, to meet whatever needs may present themselves.

And what are these needs? The chart shown in Figure 9 is telling, as it shows what mobile facilities we find most useful now, compared to what facilities we would find useful in the "ideal" environment.
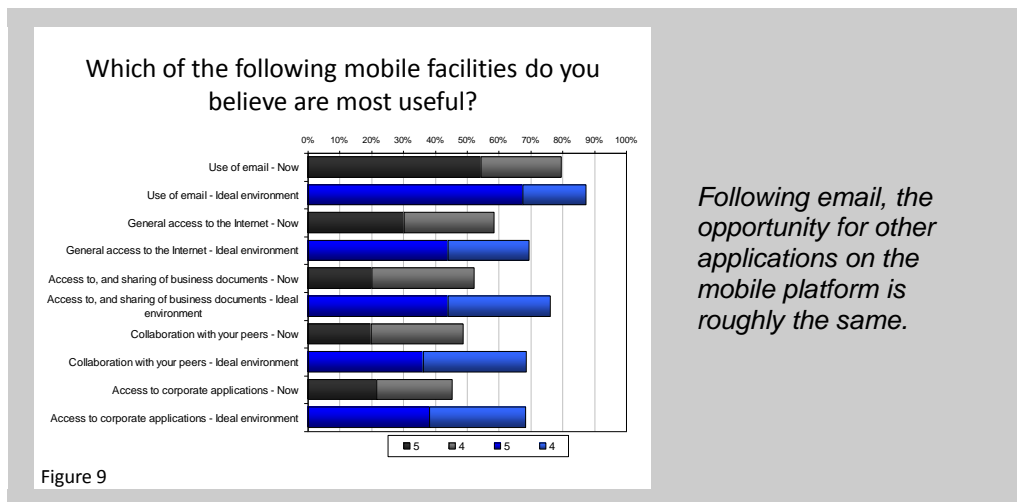
Following email, the opportunity for other applications on the mobile platform is roughly the same.

Figure 9

No surprise that email will continue to reign supreme as top mobile tool, but this isn't the big news. What's interesting about the other functions shown in the chart, is that they move up from varying levels of importance in the "now" timeframe, to a general agreement of usefulness should the ideal environment be available – they all hit the 70% mark, plus or minus 5%. From this we can surmise that mobile users see the ideal as beneficial for all their communications needs, not just a handful; unlike today, they will be able to pick the right tool for the job rather than having a selection forced upon them due to inadequacies in the current setup.

So, will we all be walking around with Internet-enabled sunglasses and fingertip micro-keyboards in a few years time? Difficult to say – but then, who would have thought we'd see people talking into thin air or sporting saucer-sized Bluetooth earpieces. Sadly, only about 10% of our board of respondents believe that they're likely to see any major upgrades to their own kit over the next year, so we're probably talking more about evolution than revolution. When technology passes the always-on threshold however, you can expect people to use it with impunity.

Conclusion

If there's one thing the research tells us, it's that there's not going to be one package to suit all comers. Laptop users have different requirements to the road warriors, who prefer access via their smart phones and handheld devices; similarly, if employees have to travel overseas with any frequency, roaming costs and other factors come into play. Such criteria are still relatively new to the corporate accounting psyche – "Roaming is a hidden travel cost that only recently the accountants became aware of, when estimating the average cost of a trip," said one respondent.

With only the tiniest of minorities telling us that mobile access is unnecessary to their organisations, it is important to build a coherent picture of what's required. From the responses to the poll we can see there is both good news and bad news. The bad news first: technology is not yet 'there' in terms of available devices and their capabilities. With this however comes the good news, which may be expressed in terms of latent demand for always-on mobility.

Meanwhile, mobile users will also need the right kinds of tariff structures and fair use policies to fully take advantage of always-on according to their own needs. The range of views we have picked up on these issues may be diverse, but some themes are coming through loud and clear. Not least, the importance of a consistent, predictable view onto services and how they are charged; also, the importance of hybrid service packages that offer the best of both 3G wireless and WiFi.

For organisations wanting to modify or renew their mobile service contracts, the best advice we could give is to review what your needs are in terms of device access – this boils down to, do your staff need largely laptop access, handheld access or a combination of both? Then, look for the best package to enable connectivity, at the most predictable cost. This latter point may not be intuitive – costs outside the bundle can be much higher, so it may be better to pay a little extra up front for example, to have a few extra megabytes or minutes as part of the bundle, than to find out later that the package as originally scoped was inadequate and therefore, the resulting costs far higher than planned.

There isn't going to be any major revolution, not unless we see a sudden upswing in buying behaviour. However, we are approaching a point where always-on mobile access from a single device will become a reality. When it comes, we can expect to see quite an impact on how we participate and collaborate via mobile technology.

About Freeform Dynamics

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As part of this, we use an innovative research methodology to gather feedback directly from those involved in ITC strategy, planning, procurement and implementation. Our output is therefore grounded in real-world practicality for use by mainstream IT professionals.

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