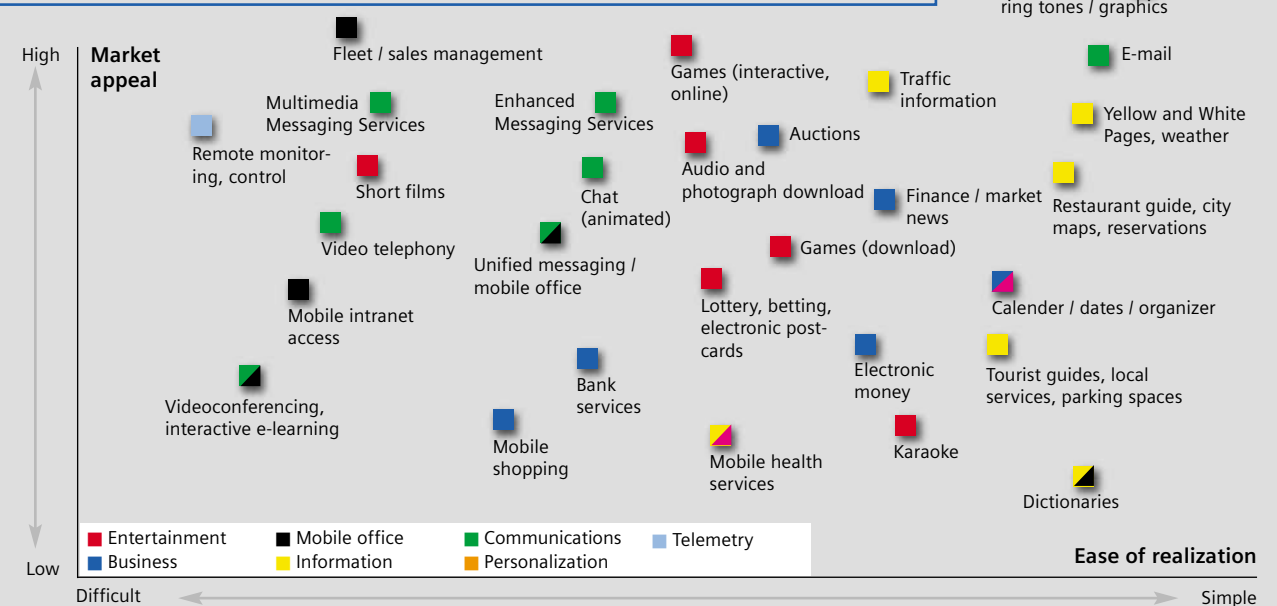




Location-based services and the mobile office (below) are among the most attractive applications for tomorrow's mobile networks.

Levels of Appeal and Ease of Implementation of Potential "Killer Apps"



Source: Booz-Allen-Hamilton Study, October 2001, et al

Plugging Customers into the Multimedia Picture



When it comes to the success of the new mobile communications networks, the biggest uncertainty remains the customer. Which applications will be attractive enough to persuade users to part with their money? Industry studies and experts are focusing on multimedia messaging, entertainment, localized and personalized services, and business applications.

The biggest challenge in planning tomorrow's multimedia mobile communications has nothing to do with technical issues — as UMTS pilot projects on the Isle of Man and other locations or a look at Japan clearly demonstrate (see pages 20 – 21, and page 17). Nor has it anything to do with the fact that the terminals required are still few and far between. Such teething troubles might perhaps delay the launch of the technology, but they certainly won't prevent it. The biggest uncertainty for network operators, hardware manufacturers, service providers and analysts is the customer. After all, the volume of demand will determine whether or not the market flourishes or fizzles. A repeat of the rather muted response to WAP services is something that the industry is anxious to avoid.

So the big question remains, what kind of UMTS applications are likely to appeal to tomorrow's customers? "We most definitely won't see the emergence of one single killer application," says Bernd Eylert, chairman of the UMTS Forum in London. "Cell phone

users will in fact enjoy a whole cocktail of multimedia services that are very precisely tailored to individual needs."

Paul Stein, director of Roke Manor Research — Siemens' research and development center in Britain, where many UMTS innovations first see the light of day — is also very much convinced that multimedia mobile communications will be a success. "UMTS has such enormous potential because it actually combines three crucial technological capabilities: high data transfer rates, the Internet, and technology that determines the whereabouts of a cell phone and then provides location-based information directly to the user," he says.

According to estimates by analysts of the ACR Group, Dataquest and others, the global market volume for mobile data services is expected to be as high as 10 billion euros in 2004.

The Technology Forecast 2001 – 2003, produced by corporate consultants PricewaterhouseCoopers, also counters speculation that the third generation of mobile commu-

m.traction: A Network of Unlimited Possibilities

Solutions, a business unit at Siemens Information and Communication Mobile, develops solutions and platforms for the mobile communications networks of today and tomorrow. "We exploit the combined expertise of Siemens to provide our customers with complete solutions," explains Volker Ziegler, who heads the unit. A crucial issue, according to Ziegler, is that of billing. "You have to offer convincing answers here if you want to hold your own in this market," he says. This means, for example, that customers should only be charged when transmission of, say, a video has been successfully completed — and not if it is interrupted through no fault of their own. At the CeBIT computer show in March 2002, Siemens showcased a whole range of new applications from the m.traction line, some of which have been developed together with business partners.

m.traction City on Air: An electronic city guide featuring location-based services with information on movie theaters, restaurants and friends in the vicinity.

m.traction 3G Shopping: Purchasing goods with a cell phone featuring a special interface for small displays.

m.traction 3G Mail: A multimedia messaging solution featuring e-mails with color pictures, video clips and music files, to which the recipient can add comments in multimedia form and then forward them to someone else.

m.traction 3G Chat: Chat rooms in which visitors are represented by avatars — small, animated figures that can make facial expressions and other gestures. The terminal converts text messages into speech.

m.traction HotStreams: A multimedia streaming solution with interactive capability. The service can be used to download video from a soccer match as well as movie clips, news items or educational material. Clickable display elements take the user directly to Web links, ordering opportunities, or even stock quotes.

m.traction Gaming: Interactive games played by two cell phone users — e.g. soccer or chess. This also functions on different terminals. One player might see a chessboard on the display, while the other, who doesn't have a cell phone with video capability, would receive the move via SMS.

New m.traction services are also being developed all the time for professional applications such as project, sales, maintenance and fleet management.

nications will fail to appeal to customers. Manfred Briede, PricewaterhouseCoopers' expert for mobile business, is confident. "You can stimulate consumer demand on the mobile communications market just as you can in other sectors. The automotive industry produces faster and more comfortable cars, and suddenly customers want them. UMTS will make a range of services faster and more convenient, and consumers will be happy to make the switch," he predicts.

Rob Conway, CEO of the GSM Association, explains what such services might be. "The SMS boom clearly demonstrates that services based on an open platform — in other words, those that are available in all networks and with all terminals — are highly attractive. And the same is true for services that are easy to understand and easy to operate, as well as services that are tailored to a person's needs, and which feature useful and varied content," he says. All in all, international studies and experts tend to agree that the following trends will play a central role (see graphic above).

Trend 1: Symbol of a New Lifestyle "UMTS makes the Internet mobile," is the simple but striking message of many advertising campaigns. Be that as it may, tomorrow's UMTS users are unlikely to be downloading the kind of Web pages featured on today's Internet. Given the small format of the terminal display, the emphasis will proba-



bly fall on pure information, although this will be enriched with images, sound and even video clips. While cell phone users are likely to spend comparatively short periods of time on the Internet, they will tend to call up information several times during the day. The key issue here will be customized services. In

the future, users will have their own personal portals that are tailored to their precise needs.

Experts identify two main sources of growth in the market for multimedia mobile communications: profes-

sional users and, above all, the younger generation. "The multimedia cell phone will become the medium of choice for young people; it will be a status symbol as well as the expression of a new lifestyle," predicts Shum

Shingh, senior analyst at Durlacher Research in London. It's a view also confirmed by several surveys. A market research study by the Taylor Nelson Sofres Group indicates that the typical consumer with a high level of interest in UMTS cell phones is male, under 35 years of age, and a cell phone and Internet user.

Correspondingly, experts predict that the most successful applications will be those tailored to this group — services that provide entertainment and connect people. In particular, operators of Multimedia Messaging Services (MMS) — a further development of the popular SMS — will be looking to gain high

revenues. While SMS is used to send simple text messages, MMS — and, to a lesser extent, its predecessor EMS (Enhanced Messaging Services) as well — transmits messages of practically unlimited length and with picture and sound attachments, just like an e-mail sent from a PC. The lifestyle theme also covers →

Multimedia in Motion:



UMTS on the Isle of Man

The Isle of Man is home to the first field test in Europe of a third-generation mobile communications network. Featuring location-based services, the new network guides users to all the interesting sights, including the next pub or even a nearby ATM.

Richard McGuinness, project manager at Manx Telecom, is crazy about UMTS. "Just imagine you're on vacation, and all it takes is one phone call to show your friends the beautiful view of the beach. Or if you have an alarm system with a video camera installed in your house, you can check at any time to see that everything's all right back home," he enthuses.

The seedbed for third-generation mobile

communications is to be found on a small island in the Irish Sea that belongs neither to Great Britain nor to the European Union. The Isle of Man is a British Crown possession but has its own parliament and home rule. With a surface area of some 225 square miles, a population of 75,000 inhabitants and a modern telecommunications infrastructure, it's an ideal place to give UMTS a run for the money.

Back in 1999, the Isle of Man government granted a license free of charge to Manx Telecom, a subsidiary of mm02 (formerly British Telecom Wireless), to establish a UMTS network — the first in Europe. Now that Siemens and NEC have completed installation of the network, technicians have been busy for several months testing and optimizing it. "We've got a total of 28 UMTS base stations here; that translates into 85 percent coverage," says Siemens project manager Rudolf Siegert.

In January 2002, journalists were invited to the headquarters of Manx Telecom to inspect the cell phone of the future. The silver model from NEC has a foldable display somewhat smaller than a credit card, and a keypad that also features four cursor buttons. Calls to Germany — to both fixed and mobile net-

works — function without any problem whatsoever. The connection is perfectly stable and noiseless.

But what about the next level of difficulty — surfing the Internet? A Manx Telecom employee calls up the Manx "Pronto" portal and then stages a competition between a GSM and a UMTS cell phone. With a data transfer rate of 384 kilobits per second (Kbps), it only takes a couple of seconds for the UMTS model to download Pronto's homepage. But things are not quite as smooth for the GSM phone. At 9.6 Kbps, it is still downloading the page after a whole minute has passed. At present, it is still necessary to connect the UMTS cell phone to a notebook via a USB interface before surfing the Internet or writing e-mails. That said, however, it's no problem to send e-mails, check out Web sites or download videos.

O.K., but what about the toughest challenge for UMTS — a videophone call? Although it takes three attempts before it works, the other person is indeed visible, even if the picture is somewhat blurred and the contrast rather dark. Here again, some additional hardware is required — the built-in camera and display of the so-called image viewer terminal. Only then can you get a true picture of the person you're calling and also send an image of yourself.

At present, users on the Isle of Man have a choice between seven different applications, including information on the local cinema program with short previews, or the sports section from Pronto. For those in need of a little diversion, the system also features online games. Another service — "Isle of Man on Air" — provides users with information tailored to their precise location. To test



Using a UMTS cell phone as a videophone. In test operations on the Isle of Man, the user requires an additional terminal — an image viewer with camera and screen — but the caller is clearly recognizable.

it, we head out to the car, which is waiting at the entrance. The vehicle features a navigation system and a notebook that is wired up to a UMTS phone. The navigation display shows an enlarged street map on which a red point — the car itself — moves slowly forward. Another window can be opened on the right-hand side of the screen. This lists information on golf courses, things to see and gas stations. For people looking for overnight accommodations, a hotel-finder service will locate a room and book it online. Finally, a click on "Find the nearest..." reveals the way to the next pub serving the island's very own whisky, "Manx Spirit," — plus information on the location of the nearest ATM.

In January, Manx Telecom distributed

200 UMTS phones to selected test users — schoolchildren, businesspeople, housewives and government officials. The experts are already looking forward to their feedback. As McGuinness explains, the company not only wants to operate and optimize the network, but also provide genuine services.

On the hardware side, a larger display and a user-friendlier keypad are certainly to be recommended. And if the camera were fully integrated and battery capacity substantially boosted from the current one and a half hours, the new UMTS cell phone would be just about perfect. "We need to do some more work on the phones," admits Siegert. "And we also need chips that have better power economy and can work in both a GSM and UMTS network." According to Rudi Lamprecht, head of Information and Communication Mobile, the first UMTS/GSM cell phones from Siemens should be ready for launch in the fourth quarter of this year.

Evdoxia Tsakiridou



Siemens project manager Rudolf Siegert (above) holding a UMTS design study. "Isle of Man on Air" (left) is a location-based service from Siemens that provides subscribers equipped with an NEC UMTS cell phone and a notebook with directions to the nearest gas station, hotel or pub.

music and games — which users can download from the Internet onto a mobile terminal and also play interactively with other cell phone users — as well as animated chat rooms. The latter involve the use of animated figures that represent the cell phone user in a virtual chat forum and utilize a variety of facial and bodily gestures. Watching videos or live broadcasts, on the other hand, will probably remain a niche market for a while, given the small size of the displays currently used

and the high cost of transmitting the large volume of data involved. What's likely to prove more practical, however, will be short trailers for advertising the latest movies or live action videos from major soccer matches.

Tomorrow's mobile communications will ensure that users have constant access to the information they want and need, and that



Chat participants in virtual rooms take on the identities of fantasy figures.

means news services are set to play a key role. Here, important items for specific users will have to be filtered out from a flood of new information.

Once again, personalization will be a crucial factor. For example, future users might employ a so-called software agent to produce a personalized electronic newspaper (see article on agent technology in *Pictures of the Future*, October 2001, pages 50 – 59). One customer would then receive all the latest sports news every morning, while another would be sent local news and a horoscope, and still another all the latest stock market and business news.

Trend 2: Services on the Move

The cell phone is set to become an important travel companion for people on the move. Location-based services will provide customers with information tailored to wherever they happen to be. In unfamiliar cities, for example, tourists will be able to find a whole range of handy tips. How do I get to the beach from here? Where's the cheapest hotel? Are any of my friends in this part of town? One option would be to present this information on cell phone displays in the form of a map with comments.

The cell phone of the future will also be able to act as a tourist guide and provide sightseeing tips for particular areas. And for the businessperson looking for a place to eat in an unfamiliar city? No problem. The cell phone will know its user's current whereabouts and will search for a nearby restaurant before guiding the user to the next available parking space. For analysts from the Durlacher Research Group, such services have a promising future, particularly for users in big cities.

At the same time, such location-based services might involve a whole range of further applications and business models. For example, customized traffic information and rerouting recommendations could help users to avoid traffic jams. Alternatively, the transmission of positional data when making an emergency call could help to save the lives of victims of accidents or illness.

Trend 3: The Mobile Office

Business travelers and employees in the field will also profit from the high data transfer rates of the new mobile communications technology. For these people, the most important companion may well turn out to be a personal digital assistant or a notebook. In the future, it will be possible to call up company networks via mobile Internet access, enabling users to download large databases or presentations from anywhere in the world. And when extremely high data transfer rates are required, business travelers will also have W-LANs at their disposal in hot spots — places like hotels, trade fair venues or airports (see pages 9 – 11). Such business applications will require adequate security to protect company networks from unauthorized use or manipulation. The same applies to finance applications — such as bank and stock market transactions — and shopping via cell phone. Before such services can become successful, they will have to gain the user's trust. Less problematic, on the other hand, will be the use of cell phones to pay out small amounts of money — for example, at vending machines or for purchasing tickets in local public transit systems (see article on electronic money in *Pictures of the Future*, October 2001, pages 34 – 47).

Trend 4: The Big Question

In principle, there is relative agreement on the major trends. "UMTS will establish a new platform for the mobile information, entertainment and consumer society," predicts Theo Kitz, analyst at Merck Finck & Co bank. As SMS has shown, the market could develop an unexpected momentum of its own and generate a range of completely new services. A few years ago, for instance, when SMS was already technologically feasible, no one would have predicted that a billion text messages would be sent every day — a service that now accounts for between 10 and 20 percent of total revenues. As such, it would take a courageous analyst to exclude the possibility of something similar happening in the multimedia mobile communications industry.

Sebastian Moser / Ulrich Eberl

Getting New Business Ideas off the Ground

Siemens Mobile Acceleration GmbH (smac) supports start-up companies involved in developing innovative applications for mobile communications networks. These companies not only receive financial assistance; they also gain access to Siemens' expertise and service — ranging from a global research and sales network to management consulting and the provision of office space. smac has office locations in Oberhaching near Munich, Germany, as well as in Stockholm, Paris, Beijing and Shanghai, with other countries soon to be added to the list. The companies supported by Siemens Mobile Acceleration GmbH include:

■ **scaraboo GmbH** develops betting, quiz and agility games for cell phones. The special feature of these games is that the odds are updated dynamically. In the future, a customer with a video-enabled cell phone will be able to watch a soccer game, a Formula 1 race or a horse race, for example, and then place bets right up to the last minute before the finish.

■ **Siemens Mobile Travel Solutions GmbH** has developed the "TravelAngel" platform, which makes it possible for company employees to manage their own business trips. TravelAngel "watches" over travellers en route and automatically notifies them via cell phone about traffic jams, weather, flight delays, hotels, possibilities for changing reservations and much, much more.

■ **The PhonePages of Sweden AB** has presented a technology that automatically loads the caller's "cell phone homepage" onto the recipient subscriber's cell phone. The page can contain information such as the caller's address and a photograph. With this system, a customer could, for example, call up a restaurant and check out the menu — while the restaurant would receive the caller's homepage, including his or her electronic business card.



While John and Rebecca are talking, they both automatically receive the other's "phone homepage" on their cell phones.

Oh, it's you Rebecca!

Hi John!