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Telecommunications Predictions

TMT Trends 2008

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About TMT

The Deloitte Touche Tohmatsu (DTT) Technology, Media & Telecommunications (TMT) Industry Group consists of the TMT practices organized in the various member firms of DTT and includes more than 6,000 member firm partners, directors and senior managers supported by thousands of other professionals dedicated to helping their clients evaluate complex issues, develop fresh approaches to problems and implement practical solutions.
There are dedicated TMT member firm practices in 45 countries and centers of excellence in the Americas, EMEA and Asia Pacific.
DTT's member firms serve nearly 90 percent of the TMT companies in the Fortune Global 500. Clients of Deloitte's member firms' TMT practices include some of the world's top software companies, computer manufacturers, wireless operators, satellite broadcasters, advertising agencies and semiconductor foundries – as well as leaders in publishing, telecommunications and peripheral equipment manufacturing.

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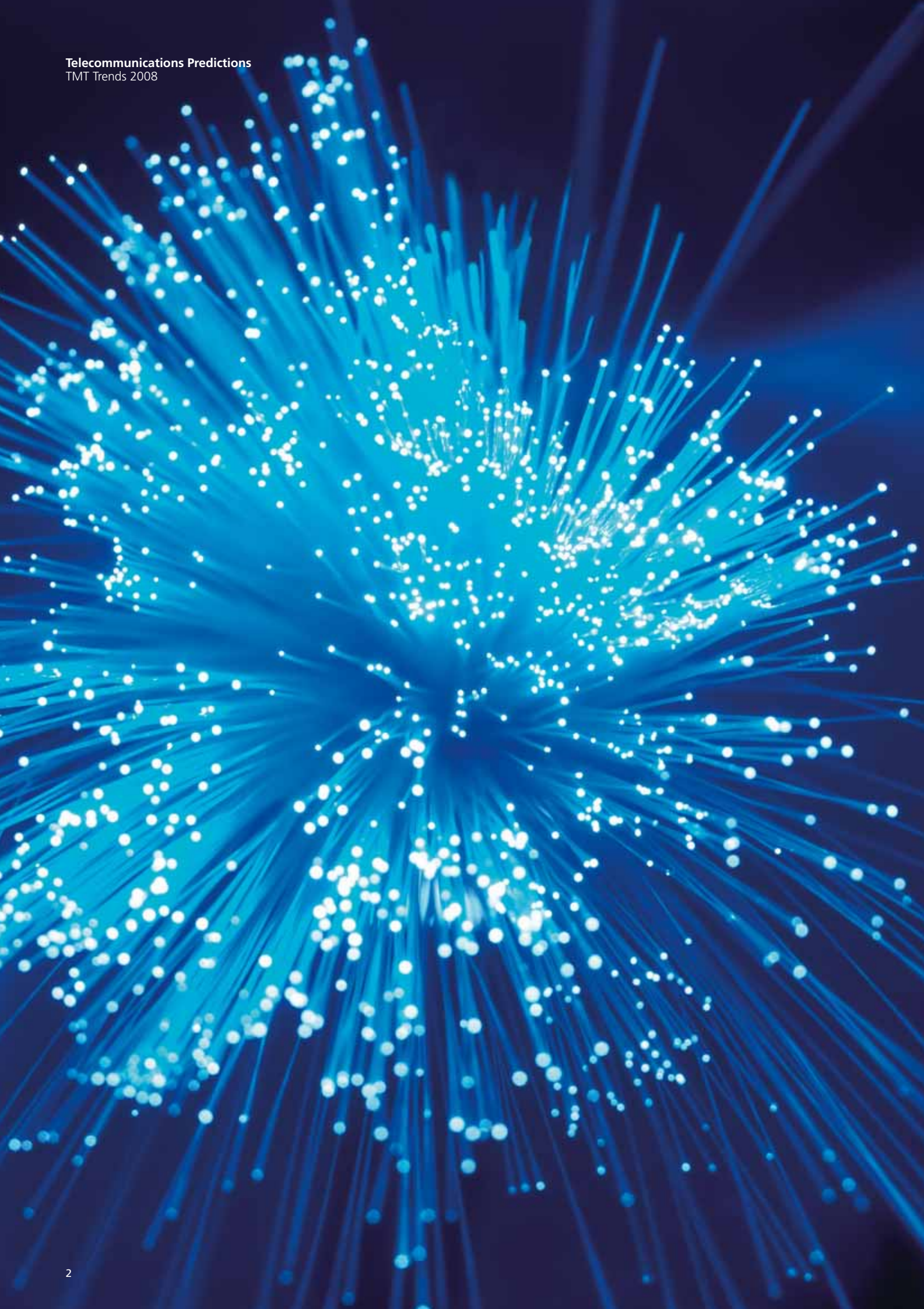


Foreword

Welcome to the 2008 edition of the DTT Global TMT Industry Group's **Telecommunications Predictions**.

As predicted in last year's Telecommunications report, concerns about inadequate capacity in the networks that underpin the Internet grew, particularly as video streaming and downloading continued to increase in popularity. The net neutrality debate became less charged, as opposing sides started to take a more constructive stance. Broadband appliances, particularly games consoles and connected digital music players, helped to shift the center of gravity of the broadband market away from the PC, albeit slightly. As predicted, mobile television failed to gain significant traction, with some services ramping down or shutting down entirely due to weak demand. Many mobile operators accelerated their deployment of technologies designed to boost indoor coverage, and new data suggested that in-building usage was greater than ever. IPTV struggled to differentiate itself from regular television, and overall, demand for the medium remained niche. The mobile data industry continued to be dominated by exchanges of small packets of data, such as messaging and ringtones, rather than large multimedia files. Fixed operator triple-play launches were widespread, but discounting remained the main marketing tool – leaving the proposition's power to deliver profits open to question. The connectivity chasm grew ever wider, as the wealthy enjoyed increasing connectivity options, while the poor were left with few, if any. And free offers continued to be used across the sector, although their impact on penetration growth, particularly in some of the world's most developed markets, was limited.

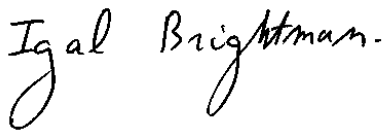
The outlook for the telecommunications sector in 2008 is similarly varied. This year's Predictions cover: the impact of a possible economic downturn on the telecommunications sector; the growing viability of a machine-to-machine market, catalyzed by the imminent arrival of the $10 mobile phone; a more positive approach to disruption in the telecommunications sector; how to make the convergence of GPS and mobile technology a commercial success; the growing importance of communications to new media companies; the rise of mobile network sharing as a means to get mobile indoors; the increasing importance of making communications accessible to all consumers; the rise of the emerging market global mobile titan; the uncertain relationship between bandwidth and revenues in the broadband market, and the outlook for GSM as it reaches 21 years of age.

I am often asked how the DTT TMT Global Industry Group's Predictions differ from the many similarly titled reports produced by other organizations. I believe Predictions has a unique combination of objectives and methodology.

The Predictions series has been designed to provide a diverse selection of views and thoughts that challenge, inform and engage industry leaders and executives. It neither aims, nor claims to be a comprehensive forecast of every anticipated event. Its aim is to provide a point of view, but by the very nature of predictions, the outcome may differ from original expectations.

The inherent unpredictability of the global telecommunications sector can be mitigated by having a robust methodology that synthesizes multiple sources of information and a wide body of opinions that require thorough peer reviews. The 2008 series of Predictions has drawn on internal and external inputs from conversations with member firm clients, contributions from DTT member firms' 6,000 partners and managers specializing in TMT, and discussions with industry analysts. As last year, Predictions for the telecommunications sector has been able to draw upon the insight gleaned from a series of 20 interviews with leading executives from around the world on the key industry theme of digitization. These interviews have been published in a book, **Digital Dilemmas**, available online (www.deloitte.com/tmt).

I hope the result of our endeavours provides you with plenty of food for thought for the year ahead. On behalf of DTT's Global TMT Industry Group, may I take this opportunity to wish you all the best for an enjoyable 2008.



Igal Brightman
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Executive summary

What appeared to be at first a problem affecting the US sub-prime mortgage sector may actually lead to a wide-reaching economic slowdown. This may in turn cause a downturn for the telecommunications sector in 2008. Equipment manufacturers may be hit by customers deferring equipment purchases. However, service providers may be protected by the world's dependence on telecommunications services and recent price cuts. An economic slowdown may even encourage some businesses to accelerate process changes that require communications. Nonetheless, a downturn may cause businesses and consumers to reduce spending wherever possible, including on telecommunications. Investment in new networks and manufacturing facilities may be constrained by the higher cost of borrowing. The industry should be prepared to confront, or even better, to exploit, this possible outcome. Mobile operators could use the prospect of a downturn to encourage consumers to consolidate all their voice spending on mobile, so forgoing the monthly fixed-line rental. Fixed operators should also consider offering lower monthly rates in return for longer contract terms, in order to stabilize medium-term revenues. Retailers, particularly those specializing in the mobile industry, may have to diversify into related services. For all concerned, but equipment vendors in particular, growth in emerging markets could offset potential declines in the developed world.

The price of mobile phones has fallen sharply and a growing number of models are now priced at under $50. In fact there are plans for the launch of a mobile phone with a wholesale price of $10 in 2009. Lower priced handsets are likely to increase overall mobile penetration rates, which are rapidly approaching saturation point. But as global mobile ownership approaches 50 percent, the growth rate for mobile is expected to slow. The market in developing countries may be constrained by the aspiration of some customers to own more expensive phones as a symbol of their increasing prosperity. However, another market, so far little exploited, could be a major consumer of a $10 mobile – the machine. Integrating mobile connectivity into machines could take the total addressable market for mobile subscriptions to tens of billions. For mobile to be deployed in machines on a large scale, the cost of deployment, as well as the cost of the module itself, should be minimized. Mobile manufacturers should work closely together to develop a single, globally recognized standard that includes specific guidance on size. Businesses will integrate mobile modules into their devices only if standards covering the specifications of the mobile modules themselves and their communications protocols exist.

Over the past few decades, the telecommunications sector has had a strong association with disruption. With the arrival of each disruption, the typical response has been to proclaim the imminent demise of the incumbent technology. Yet more often than not, the incumbent players themselves have tended to benefit most from disruption. VoIP had been expected to kill off PSTN and mobile voice. WiFi networks were supposed to destroy mobile data networks. Some commentators have suggested that WiMAX may bring down telecommunications titans' data businesses. While the threat of disruption has frequently come and gone, many underlying technologies survive, often thriving within an incumbent's portfolio. WiFi has become a significant element of mobile operators' overall service portfolio. VoIP in the hands of fixed incumbents has been deployed as a more efficient means of transporting voice traffic from its point of origination to its destination. The telecommunications industry may realize in 2008 that while disruption is likely to remain, it does not imply the destruction of legacy.

Incorporating new functionality into an existing product does not always add value. Satellite positioning should not become just another technology integrated into a mobile phone simply because the price of the former has fallen to a few dollars. The mobile industry needs to identify the specific applications and services that could result from a combination of mobile handsets and location data, by considering several critical differences between the uses of satellite navigation in vehicles and how it may be used by pedestrians. During 2008, it may become apparent that mobile may fit better into GPS, than GPS into mobile phones. Manufacturers may also want to consider how positioning functionality could provide additional revenue streams on top of handset sales. Operators should try to understand how the technology could be used to enhance the value of other existing services, such as messaging, or serve as the platform for entirely new ones. But mobile could also be used to address one of the key weaknesses of GPS – its need for line of sight of satellites.

A characteristic common to many new media websites in 2008 is likely to be a portfolio of communications tools, from traditional email to experimental media, such as digital 'pokes'. New media sites are also expected to foster one-to-many, or even one-to-everyone communication. The range and quality of communications tools offered on a new media site could become a significant differentiator in an increasingly competitive market. All of these trends may reassure the telecommunications industry that demand for communications is more vibrant than ever. Demand for new media may, however, also highlight the inability of the telecommunications sector to monetize more of this need. Communications companies should address which parts of the value chain they should aim for. As well as providing the underlying network infrastructure, where else could they profitably operate? They should also undertake research to identify the next big way of communicating. Companies should distinguish between communications services that customers may consider worth paying for, and features that are just nice to have. Offering branded communications tools used on new media sites could prove an important long-term strategy. Earning a reputation for providing the most robust email, or the least spam-afflicted IM, could be a means of engendering consumers' loyalty.

In the last few years, mobile has steadily evolved from an outdoor network into an indoor network. During 2008, operators are likely to evaluate various ways to improve indoor coverage. Deploying GSM-based femto cells may initially be a popular option. However this approach may ultimately be considered too technically and strategically challenging. Operators may also consider single handset solutions. But this approach faces obstacles in the form of handset

cost, the need for voice-quality WiFi throughout buildings, and the technical complexity of managing cellular to WiFi handoff. In 2008 the combination of these trends, and the lack of viable alternatives, may cause some operators to contemplate, and in some cases undertake, network sharing as the best way to reduce network-related overheads and boost indoor coverage. While sharing has attractive economic benefits, regulators and customers may worry about its impact on independence, innovation and quality. As with any major strategic decision, the quality of execution is likely to be fundamental to the success. Network sharing can reduce capital expenditure and operating overheads, but it could have many pitfalls. Operators entering into network sharing should table comprehensive agreements that have considered a wide range of eventualities. Operators should consider how best to create shared departments for network strategy and planning to minimize the potential for disagreement.

The telecommunications industry can appear too focused on serving the youth market. This can result in products and services that while looking good may be daunting to use for the cash rich, but visually challenged older generations. Creating products and services that do not take into account older age groups' lack of familiarity with technology may also restrict the available market. The telecommunications sector should increase its focus on developing accessible products and services. This could address corporate social responsibility objectives and also please financial stakeholders. Several products and services, such as large-button phones and talking text messages, designed from the outset to be accessible to older generations and people with disabilities, have become mass market successes.

The will to grow via acquisitions is likely to remain strong in the mobile telecommunications sector. Developed world mobile operators are looking to purchase stakes in emerging markets to tap into growth and high EBITDA margins. Western operators may also be able to learn important lessons relating to cost optimization from operators in developing countries. However, acquisition targets may increasingly become acquirers in 2008. Following a trickle of acquisitions by emerging market operators in 2007, players in these regions may become increasingly active predators. Emerging market operators should focus most attention on other emerging markets, rather than make a play in the developed world. Both developed and developing world operators should take the opportunity to learn from one another. Any operator with a presence in emerging markets should benchmark taxation levels for handsets and services against other countries.

Speed also remains enticing for the telecommunications sector. In the wireline sector, the current speed to beat is 100 Mbit/s. In the wireless sector, the latest technology attains over 7 Mbit/s, itself faster than many wireline broadband speeds. The rapid adoption of fixed broadband appears to have demonstrated that significant demand already exists among at least 330 million households for applications and services that require more speed. However take-up for mobile broadband appears to have been far slower. The bulk of revenues in the mobile sector, even in the most advanced countries, comes from voice and data services supported by 2G networks. But in 2008, with the possibility of the credit crunch affecting investment decisions, there may also be a growing group of individuals who question the consumer need for faster speeds and the tens of billions of investment dollars this may entail. Telecommunications companies should be careful not to prioritize the quest for attaining the limits of what is technically possible, over the need for profitability.

On 7 September 2008, GSM will be 21 years old. On that particular day more than 700 GSM networks in more than 200 countries are expected to carry more than 16 billion minutes of calls and six billion text messages. GSM's global subscriber base is forecast to grow by 1.2 million and over six million GSM handsets are expected to be manufactured. GSM is forecast to generate $3 billion or 1.36 percent of the world's daily GDP. GSM's success has been achieved despite facing a number of significant challenges. It has outcompeted other digital cellular technologies, and by the beginning of 2008, is expected to have 85 percent market share. As it comes of age, its outlook is expected to remain as challenging – and as rewarding – as ever. Churn remains a significant factor for many operators; adoption of data services could be faster; there may also be regulatory challenges ahead. In 2008, GSM mobile operators should enjoy their historical triumphs but also prepare for the many challenges ahead. They should review strategies for every aspect of their businesses.

From credit crunch to communications crisis?

What appeared to be at first a problem affecting the US sub-prime mortgage sector may actually be a slowdown affecting many of the world's industrialized nations[1].

A vital question for the telecommunications sector is likely to be the extent to which the credit crunch, a global contraction in the availability of credit, may provoke a crisis in the telecommunications sector in 2008[2].

An optimistic outlook for the telecommunications sector in 2008 would be that most companies should not suffer significantly, even in countries with large financial sectors that could bear the brunt of the sub-prime correction.

However, the impact may vary by type of company. Equipment manufacturers may be harder hit. It may be easier for a business or residential customer to defer an equipment purchase than to suspend voice or data services for a period.

As for service providers, they may be better able to weather the storm, at least in 2008. The world appears to be far more dependent on telecommunications than ever, and costs have generally fallen. Enterprise communications prices have declined steadily, in line with growing competition and the emergence of efficient software-based solutions[3]. Consumer mobile and broadband prices have also fallen significantly, through a combination of excess supply[4], competition and regulation[5]. In some markets, consumer broadband is nominally free if other services are purchased, making it particularly hard for customers to cut out this portion of spending[6]. Given this, service revenue growth may hold steady, even if there were to be a downturn in 2008, and as a result, operators' stocks may be seen by investors as secure.

An economic slowdown may even encourage some businesses to accelerate process changes that require communications. The need for efficiencies may encourage some companies to accelerate their use of offshoring; it may cause others to use home working as a means of reducing office costs; it could stimulate some companies to implement mobile data solutions as a means of improving productivity.

A more pessimistic outlook is that the gut reaction to a downturn may be for businesses and consumers to reduce spending wherever possible. Businesses may look at ways to cut telecommunications costs, both by negotiating hard on rates and applying stricter rules on usage among employees. Consumers may try to cap their spending by opting for smaller mobile bundles or downgrading broadband packages.

Investment in new networks and manufacturing facilities may become harder to justify, as higher interest rates raise the cost of borrowing. This in turn may have an impact on an operator's ability to develop new services. Equipment manufacturers, software developers and other suppliers may suffer as a result.

Macroeconomic trends are hard to predict and even harder to influence. In the light of current trends, telecommunications companies, while hoping for the best, may need to prepare for the possibility of an arduous 2008.

The need for efficiencies may encourage some companies to accelerate their use of offshoring; it may cause others to use home working as a means of reducing office costs; it could stimulate some companies to implement mobile data solutions as a means of improving productivity.

Bottom line
While a downturn in the telecommunications sector is far less certain than a global slowdown, the industry should be prepared to confront, or even better, exploit, this possible outcome.

Mobile operators could use the prospect of a downturn to encourage consumers to consolidate all their voice spending on mobile, so forgoing the monthly fixed-line rental. A growing number of consumers have already chosen to make all voice calls via their mobile phones[7]. Operators could try and maintain revenue flows by offering customers lower tariffs in exchange for longer contract terms. This offer may also encourage prepay customers to move onto a contract.

Non-core mobile services, from music downloads to mobile television, could be most affected if consumers cut their spending[8]. Operators may therefore want to concentrate product development and marketing on the services they regard most likely to generate the bulk of revenues and margins, which in many markets are currently voice and messaging[9].

Mobile operators could also consider a renewed focus on the enterprise market. Operators could argue that mobile-based solutions, such as email and field force automation, could deliver vital efficiency gains to corporations.

Mobile operators may also need to consider starting or accelerating network sharing, for example, their radio access networks, as a way of reducing the cost of deploying and running networks, particularly if data usage remains low.

For **fixed operators**, demand for consumer broadband is likely to remain relatively steady. Non-core services may, however, suffer. Operators may therefore need to look again at their approach to bundling. Offering discounted combinations of fixed voice, broadband and IPTV appears to have become a common approach among fixed operators. While theoretically this offers good value to the customer, if the market were to slow, the value proposition could unravel. With fixed voice usage in sharp decline[10] and IPTV embryonic[11], operators may find consumers increasingly indifferent to bundles, particularly in markets where mobile prices are low and free-to-air digital television is widely available. Consequently, operators may find a 'pick and mix' approach more compelling and more profitable. By allowing consumers to choose which services they want to bundle, they may be able to improve perceived value, while offering greater choice and flexibility[12] .

As with mobile, fixed operators should also consider offering lower monthly rates in return for longer contract terms, in order to stabilize medium-term revenues.

As for the enterprise market, fixed operators should highlight the range of operational efficiencies that could result from more, rather than fewer, communications. Operators could therefore recommend an acceleration of offshoring, video conferencing and home working, all of which could reduce costs.

Fixed operators may also need to re-examine their plans for next generation networks. Many operators' long-term strategies assume fiber-based networks. While the credit crunch may raise the cost of finance, networks may have no choice but to upgrade, not least because of the expected operational efficiencies from next generation networks[13]. Operators may have to share the cost and risk with partners, or try to renegotiate terms with financiers and suppliers.

Retailers, particularly those specializing in the mobile industry, may have to diversify. Mobile operators are constantly reviewing channel costs such as commissions and subsidies. Should a country's economy slow, operators in that market may focus efforts on their own branded stores at the expense of independent retailers. Should that happen, retailers may have to diversify into related products (such as PCs, peripherals and technical support) or services (such as fixed voice and broadband).

For all concerned, but **equipment vendors** in particular, growth in emerging markets could offset potential declines in the developed world. Emerging nations' economies are forecast to continue growing steadily despite turmoil elsewhere[14 15]. Telecommunications operators in emerging markets may continue to yield much higher EBITDA margins than are normal in western economies[16].

All telecommunications companies should scrutinize their cost base. Some may have accumulated excess weight, particularly during high-growth years. A slowdown may even be the impetus for some much-needed cost cutting and headcount reduction.

All companies should keep an eye out for mergers and acquisitions (M&A) opportunities. A downturn could create consolidation opportunities across all parts of the value chain. Some emerging-world telecommunications titans may even consider financial discomfort and faltering valuations in the industrialized world as the trigger to start seeking out bargains[17].

How to capitalize on the $10 mobile phone

The first mobile phones, based on analog technology, cost upwards of $5,000 apiece[18] when they were first launched in the mid-1980s. By the time digital mobile networks launched the following decade, prices had dropped, albeit only to $2,000, leaving mobile too expensive for most. At that price point it was unfeasible even to consider using mobile as a means of providing connectivity to machines. It was often far cheaper to send a human being to a machine.

Since then, however, the price of mobile phones has fallen sharply and a growing number of mobile phone models are now priced at under $50[19]. One manufacturer aims to release phones targeted at developing markets for $25 or less[20] during 2008, and there are plans for the launch of a mobile phone with a wholesale price of $10 in 2009[21].

The lower the price of a mobile handset goes, the greater the addressable market becomes. Over 80 percent of the world's population live within coverage of a mobile network[22], but half of these live on under $2 a day[23]. For this latter group, low-cost handsets could become an essential tool to increase earnings simply to the level of making a living.

Lower priced handsets are likely to increase overall mobile penetration rates. But as global mobile ownership approaches 50 percent, the growth rate for mobile is expected to slow. There may therefore be diminishing returns from lowering the price for mobile devices even more. Further, standard license fees, typically upwards of $5 per device, may impose a floor below which price cannot drop any further.

However, another market, so far little exploited, could be a major consumer of a $10 handset: the machine. Integrating mobile connectivity into machines could take the total addressable market for mobile subscriptions to tens of billions. A mobile module could be profitably integrated into a wide range of machines, from vending machines to bank ATMs.

The rewards could be substantial. There is a growing volume of machines and infrastructures that could be usefully connected. There are more than one billion PCs worldwide[24]; more than 600 million road vehicles, of which well over a sixth are commercial vehicles[25]; 18 million freight containers[26]; three million miles of oil pipeline[27], and over one million industrial robots[28]. In Europe and the United States alone there are 1.1 billion generic machines, such as computers, photocopiers, burglar alarms and point-of-sale devices that could readily be connected, yet during 2007, just 2 percent were[29]. The existence of billions of mobile-enabled machines around the world could be a significant driver for the mobile data market.

With sufficient collaboration and focus, the mobile industry could make 2008 the year in which machines finally become a driver of growth, and mobile data starts attaining the volumes and delivering the value to which the industry has aspired for many years.

Bottom line
The major opportunity for the $10 mobile phone may be the market for machines, rather than for people.

For mobile to be deployed in machines on a large scale, the cost of deployment, as well as the cost of the module itself, should be minimized. Mobile manufacturers should work closely together to develop a single, globally recognized standard that includes specific guidance on size. Businesses will integrate mobile modules into their devices only if standards covering the specifications of the mobile modules themselves and their communications protocols exist.

Vendors should also consider what features will be most keenly required. Simplicity and ease of integration are likely to be key to adoption, as industrial customers will most likely be looking for plug-and-play components. Though there may be room in the medium to long term for more advanced functions, initial success will require an unswerving focus on simplicity.

Manufacturers and operators should be aware of some of the main differences between demand for mobile from people, and that from machines. While consumers may replace their handsets more than once every year, some machines may host the same module for many years. As a result, both manufacturers and operators will have to examine how they can extract value from the provision of machine-to-machine solutions. Equipment sales and subscription revenues may remain low, and, as a result, services such as solutions and systems design, business process consulting, integration and hosting may have to deliver the majority of revenues. Operators and vendors may not currently have this skill base. Many may have to gain a full complement of such skills through acquisition or partnerships.

While machines may be the key market for the $10 phone, emerging economies may also represent a sizeable opportunity. Vendors should note that demand may be stronger in rural areas, where consumers are likely to welcome any device at an appropriately low price. In contrast, in urban areas, consumers may aspire to higher-end phones, partly as a means of demonstrating their increasing wealth[30].

But serving rural communities in the developing world, particularly at a retail level, is likely to pose a considerable challenge for companies used to the sophisticated supply chain of the west. Vendors should start working out how to get their products to India's 700 million rural population[31], for example, while still keeping retail prices accessible.

The disruption of disruption: incumbents convert threats into opportunities

Disruption implies a break in the established order. The more entrenched that order, the more disruption may frighten the disrupted and encourage the disruptor.

Over the past few decades, the telecommunications sector has had a strong association with disruption. The industry, which generates more than 2 percent of global GDP[32], has experienced a string of fundamental disruptions, such as the digitization of transmission, the emergence of cellular mobile and infrastructure-based competition.

With the arrival of each disruption, the typical response has been to proclaim the imminent demise of the incumbent technology. Yet more often than not, the incumbent players themselves have tended to benefit most from disruption.

Digitization of transmission enabled a massive increase in capacity and a significant improvement in efficiency over analog systems. Many of the world's largest mobile networks were created by fixed-line parent companies, which are expected to continue to enjoy, and in some cases even rely on, their growth during 2008. Infrastructure-based competition spurred growth in investment in network roll-outs, and even when some of these failed, it was often incumbents that were able to purchase assets, occasionally at fire-sale prices.

More recently, VoIP had been expected to kill off PSTN and mobile voice[33]. This has yet to happen, and according to some, it may never[34]. WiFi networks were supposed to destroy mobile data networks[35]. Again this has yet to happen. And looking ahead, some commentators have suggested that WiMAX may bring down telecommunications titans' data businesses[36], although this looks increasingly unlikely[37].

While the threat of disruption has frequently come and gone, many underlying technologies survive[38], often thriving within an incumbent's portfolio. WiFi in the hands of major mobile operators has become a significant element of their overall service portfolio, particularly for enterprise customers and other users of heavy data. VoIP in the hands of fixed incumbents has been deployed as a more efficient means of transporting voice traffic from its point of origination to its destination, and incumbents are now among the most successful VoIP providers[39]. And WiMAX, which has recently been welcomed as part of the 3G standard[40], may well be used by incumbents to offer wireless broadband services to hard-to-reach rural areas, as well as emerging economies.

As such, the telecommunications industry may realize that while disruption is likely to remain, destruction of legacy is not fundamental to it. Smaller companies may be able to innovate faster and better, creating propositions that can help to drive the industry forward. But such companies may lack the financial strength or the management experience to change an entire sector. Small companies may be essential for creating disruptive technologies. However, it will be the incumbents who will more than likely monetize them.

Bottom line
The primary reasons for incumbents' successful deployment of disruptors are experience, access to existing customers, marketing capabilities and capacity to support.

Telecommunications customers may be reluctant, for example, to take on services that lack the 99 percent reliability and round-the-clock support they have become accustomed to. Often, it is too expensive for any new entrant to replicate existing telecommunications industry service levels. Incumbents should exploit this advantage and seek also to exploit potential disruptors rather than develop strategies to defend against them.

For example, recently announced moves towards open development platforms in the mobile market are likely to be a step in the right direction, as they may offer a framework within which new solutions can be developed without needing to upset the status quo.

Other forms of alliance are likely to be important for incumbents and new entrants. Incumbents should trial new technologies and business models in the same way that home-grown products and services are. Both parties should develop skills in areas such as relationship management, project management and customer research.

The investment community should also consider modifying its approach. Clearly all investors dream of spotting giant-killing new technologies and business models early on. But if it becomes more difficult for new start-ups to thrive as independent competitors to the telecommunications giants, investors should consider modifying their exit strategies, perhaps focusing more attention on trade sales instead of initial public offerings.

The more innovation and advancement that takes place, the more the telecommunications industry as a whole is likely to grow. But consideration of any new technology or business model has to bear the customer in mind. The pace of change is ultimately dictated by the pace at which customers want to, and are able to, change. Whatever the degree of disruption implied, any new proposition must be practical, beneficial and timely.

While the threat of disruption has frequently come and gone, many underlying technologies survive...


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Giving mobile GPS direction

The steadily falling cost of technology means that every year the number of functions that could be included in devices continues to expand.

The toy market provides an example of how technology can re-invent even the most basic product. A few years ago, one of the best-selling holiday season gifts was a spinning top. The i-Top incorporated a push-button interface, an integrated display and a counting mechanism. In 2004, more than one million units were sold in the United States and Canada[41]. The toy included four games, the most popular of which centered on the simple challenge of seeing which player could attain the highest number of spins. Adding a simple counter increased the value of the toy and was one of the reasons why it was able to command a $20 retail price tag[42].

However, incorporating new functionality into an existing product does not always add value, even if that functionality has been a commercial triumph in another, seemingly similar context.

Satellite navigation may prove a case in point, unless the mobile industry is able to identify the specific applications and services that could result from a combination of mobile handsets and location data. During 2008, it may become apparent that mobile could fit better into GPS, than GPS into mobile phones.

GPS technology is a well-established, mainstream success in the automotive market[43]. Unit sales in 2006 approached 20 million, and are forecast to exceed 50 million units by 2011[44]. Motorists in some markets have become so dependent on satellite navigation that in some UK villages traffic levels have swollen because their navigation systems have guided them into hitherto quiet lanes[45]. GPS is also popular among hikers and skiers around the world, although this is a minor market relative to that for cars[46 47].

Prices for GPS functionality have fallen to such an extent that a growing number of mobile phones now incorporate GPS navigation. In 2008, prices for GPS chipsets will likely continue to fall to just a few dollars[48], although the cost of mapping data is likely to remain at least 10 dollars. Accordingly, the number of devices that incorporate the technology is expected to grow rapidly in 2008[49].

While the combination of GPS and mobile phones should ultimately be a success, in 2008 the industry may overlook several critical differences between the uses of satellite navigation in vehicles and how it may be used by pedestrians.

A critical requirement of satellite navigation is the line of sight between the satellites above and the device on the ground. Without it, no positioning information can be received.

In a car, this is relatively easy to attain. GPS systems are usually mounted on dashboards, or integrated into cars and linked to an external antenna. In contrast, mobile phones used by pedestrians are often kept in pockets or hip holsters. In either case, line of sight is far harder to attain. Furthermore, with pavements often in the shadow of tall buildings, pedestrians may struggle to get a signal even with the device uncovered.

Where GPS is positioned as a competitor to in-car navigation systems, there are legal issues to consider. For example, in a growing number of countries, it is illegal to use mobile phones while driving, and the law does not distinguish between using a mobile for making a call or charting a route. Furthermore, in-car GPS systems typically use the car's own power supply, a large external antenna and a bright LCD display (usually shaded from the sun's glare), whereas mobile phones generally do not.

Therefore, while a growing number of GPS-enabled mobile phones may be shipped and sold in 2008, aside from the initial novelty, they may not be used very often. This may mean additional costs for the manufacturers and operators, but little added value to consumers.

However, motorists able to avoid traffic jams thanks to their mobile-connected GPS systems may be more pleased with this application of convergence.

Bottom line
Satellite positioning should not become just another technology integrated into a mobile phone simply because its price has fallen to a few dollars. The technology should be commercially relevant for all those affected by its emergence: handset vendors, operators, and service providers (from advertisers to information suppliers).

At present, mobile phone navigation may make sense for handset vendors. The addition of a GPS chip and antenna, as well as mapping software, could allow handset vendors to increase prices, or at least slow price declines. It may also help individual vendors gain market share in the short term. In addition, manufacturers may want to consider how positioning functionality could provide additional revenue streams on top of handset sales. Vendors should consider whether the invention of new forms of peripherals, such as wearable antennas, could make GPS in mobile more valuable.

While mobile GPS may be good news for vendors, operators may find it harder to monetize this technology. Operators should try to understand how the technology could be used to enhance the value of other existing services, such as messaging, or serve as the platform for entirely new ones, such as social networking or treasure hunts.

Mobile operators should also consider how cellular technology could enhance traditional satellite navigation systems. Mobile is already used as a means of updating digital mapping data, including traffic alerts. Cellular networks' ability to track the speed of movement of vehicles, by measuring the rate at which their phones move between base stations, can also be used as input into navigation systems[50].

But mobile could also be used to address one of the key weaknesses of GPS: its need for line of sight of satellites. It therefore struggles when working in dense urban areas and cannot function within buildings. Mobile networks, via a process called triangulation, can provide that missing information. Consequently, operators may be able to add considerable value to important services such as locating missing children, which are likely to yield high margins.

Operators could then experiment with using enhanced GPS as a supplementary part of other companies' services. For example, satellite positioning could enhance roadside assistance services by automatically transmitting location and customer data in the event of a breakdown. Satellite positioning could also enhance emergency services by locating callers, even when they are inside large buildings, and fleet management by tracking vehicles.

Indeed, it could be that the real opportunity for mobile GPS is in the enterprise sector, where positioning data is more than just a luxury or a gimmick – it can make a material difference to the bottom line.

GPS technology is a well-established, mainstream success in the automotive market. Unit sales in 2006 approached 20 million, and are forecast to exceed 50 million units by 2011.

Exploiting new media's growing need for communication

In 2008, it would not be surprising if some industry analysts predicted, again, the imminent demise of the communications sector as we know it. However, whatever the outcome for the sector, it is likely that in 2008 digital communications will become more varied, vibrant and vital to the way we live than ever before.

The amount of traditional digital communication should grow, continuing the trend of recent years in which voice, text messaging and email volumes have all steadily risen[51 52 53].

People are also likely to use even more modes and methods of digital communication. New media companies, such as social networks, synthetic worlds and blogs are likely to offer the services that will initiate large volumes of traditional and newer forms of communication.

Indeed, a characteristic common to many new media websites in 2008 is likely to be a portfolio of communications tools, from traditional email to experimental media, such as digital 'pokes', used to express the simple question: "are you there?". In 2008, new media sites are also likely to stimulate considerable demand for non-verbal dialog by offering digital communication via a blend of pictures, videos, sketches and animations.

New media sites are also expected to foster one-to-many, or even, one-to-everyone communication. Blogs have given individuals the opportunity to be heard, or more often than not ignored, by over a billion online users. Through photograph-sharing sites, people can share their personal images online with selected individuals, or anyone who cares to look.

Virtual worlds, such as Second Life, are likely to use a variant of IM to enable users' avatars to communicate with each other[54].

Therefore, the facility for dialog using a range of digital platforms may become even more fundamental to the continued appeal of social networks. In 2008, the range and quality of communications tools offered on a new media site could become a significant differentiator in an increasingly competitive market[55].

All of the above trends may reassure the telecommunications industry that demand for communications is more vibrant than ever. Demand for new media may, however, also highlight the inability of the telecommunications sector to monetize more of this need. Communications companies may consider that in 2008 they are still allowing new media companies too big a share of their revenues.

Bottom line

The underlying demand for communications, enabled by new media websites, is encouraging for the telecommunications sector. However, telecommunications companies' share of new media revenues is disappointing, particularly given how central digital communication is to the appeal of many new media websites.

The telecommunications sector should consider how it can earn a greater share of revenues from communications in new media sites, since telecommunications operators' networks underpin the majority of digital communication.

The first question communications companies should address is which parts of the value chain they should aim for. As well as providing the underlying network infrastructure, where else could they profitably be? Becoming a new media company may be too far a stretch, so providing a growing range of communications tools, on a branded or white-label basis, may be a preferred direction.

If telecommunications companies do focus on providing a wider set of communications tools, they should undertake research to identify the next big way of communicating. Research and development teams could look to current physical behavior as a guide. There are many ways of adding to a face-to-face communication, from eyebrow expressions to folding arms or legs, all of which may have their digital equivalents.

Network information, such as presence, could be used as an input into the development of new communications tools, or the enhancement of existing ones.

Telecommunications companies should distinguish between communications services that customers may consider worth paying for, and features that are just nice to have. The sector should also remember that a feature in one context may be regarded as a service in another. For example, IM is a feature for many social networking websites, but could generate revenue on mobile phones. Services that are popular among consumers, such as variants on IM, may be regarded as a barrier to productivity in a business environment.

Offering branded communications tools used on new media sites could prove an important long-term strategy. Earning a reputation for providing the most robust email, or the least spam-afflicted IM, could be a means of engendering consumers' loyalty. This approach could prove to be strategic if users change a social network or virtual world frequently. Furthermore, an individual's preferred set of communications tools is likely to evolve with age. Multi-tasking communication is popular among the young, who are seemingly able to maintain various forms of conversations simultaneously. For older consumers, one exchange at a time may be enough. A strong brand, enveloping a diverse set of communications services, could mean loyalty to the communications provider over the years.

Getting mobile indoors may spur network sharing

Many countries in the developed world boast up to five mobile network operators. Each may have two complementary networks, one based on 2G technology, the other based on 3G. The fixed cost of licensing and building each network can be tens of billions of dollars[56].

The operational costs are significant. Since the turn of the decade, mobile operators have undertaken numerous upgrades to their network, adding not just 3G but a range of other network enhancements, most recently HSDPA. While the pace of network upgrades has been steady, revenue growth in developed markets has slowed[57]. At the same time competition has generally intensified, further straining margins[58] .

In the last few years, mobile has steadily evolved from an outdoor network into an indoor network. In 2008, 70 percent of mobile voice calls[59] and a similar proportion of mobile data usage are expected to originate inside a building[60] . During the course of the year, operators are likely to evaluate various ways to attain indoor coverage.

One is using femto cells, which are base stations small enough to dedicate to a home[61]. However this entails an approach that some operators may consider challenging. Femto cells would most likely be connected to fixed broadband networks, requiring mobile operators to own or have a close alliance with a fixed broadband operator[62]. There may also be issues relating to call hand-off, interference and backhaul[63].

Operators may also consider single handset solutions, known as FMC. This approach is based on a handset that could work with both internal WiFi networks and cellular networks elsewhere. The challenges for FMC in 2008, however, would be the cost of the handset, the need to deploy voice-quality WiFi networks within buildings, and the technical complexity of managing cellular to WiFi handoff[64]. Concerns over the commercial attractiveness of FMC, from the perspective of customers and suppliers may also cause operators to pause for thought[65].

In 2008 the combination of these trends, and the lack of viable alternatives, may cause some operators to contemplate, and in some cases undertake, network sharing as the best way to reduce network-related overheads and boost indoor coverage[66]. Partial network-sharing activities are already in place in Australia[67], the United Kingdom[68], Italy[69], Spain[70], and India[71], and other agreements are in the process of being drawn up. The move to network sharing would recognize the growing belief that in 2008 the business model for cellular mobile that has prevailed until now may no longer be viable[72] .

While sharing has attractive economic benefits, regulators and customers may worry about its impact on independence, innovation and quality. The experience of the fixed broadband market, where a number of regulators have required the dominant player to open its network, has suggested that the customer experience can suffer, particularly if cooperation between operators is lacking[73].

While sharing mobile networks would more typically be on equal terms, with networks of equivalent size being combined, there may still be scope for politics and the practicalities of sharing to affect service quality. As a result, the success or failure of mobile network sharing may depend on the amount of management time and attention it receives.

Bottom line
The need for improved indoor mobile network coverage is likely to be increasingly important for operators. With an increasing proportion of traffic moving indoors as the process of fixed displacement takes hold[74], mobile operators are likely to have to act rapidly.

As with any major strategic decision, the quality of execution is likely to be fundamental to the success. Network sharing can reduce capital expenditure and operating overheads. But it has many pitfalls.

Operators entering into network sharing should table comprehensive agreements that have considered a wide range of eventualities. Operators should consider how best to create shared departments for network strategy and planning to minimize the potential for disagreement. Any agreement should therefore include clear processes for dispute resolution.

Operators should also consider longer term strategic issues, such as investment in emerging or as yet unknown technologies. Each operator may have a different view as to the viability, timing, source and coverage requirements for each. They should manage and monitor network sharing arrangements at the highest level possible.

Lobbying regulators is likely to be important. Operators should be able to demonstrate that network sharing will directly benefit the customer, in terms of total network coverage and also quality of service.

Regulators should take network sharing requests seriously. While the strategy is a break with the past, it may prove an essential evolution for the mobile industry.

Operators should also consider partial network sharing, initially in limited geographic areas or for individual services such as WiFi hotspots. The experience of partial sharing could provide the basis for more fundamental network sharing.

In 2008, 70 percent of mobile voice calls and a similar proportion of mobile data usage are expected to originate inside a building.

Gray is good: the return on investment from making telecommunications accessible to all

Three years ago, there were already more people over 50 than under 20 in North America. In Europe, it is forecast that by 2010, those over 60 will outnumber the under-20s. And by 2020, there will be 75 percent more over-50s in North America and Europe than those under 20[75].

Many readers will be familiar with these trends. But knowledge of where personal wealth is concentrated often appears to be overlooked: the over-45s already hold a far greater share of the wealth of the world's most developed nations than the under-45s[76].

Yet, despite this, the telecommunications industry can appear too focused on serving the youth market. In 2008, this oversight is likely to continue, even though this may be damaging to the sector's bottom line.

At many telecommunications industry conferences, almost every panel seems to highlight one common line of thought: look at what the young are doing and serve their needs. This discussion may well continue through 2008. Go to a store specializing in telecommunications products and services, from mobile phones to broadband, and the emphasis again appears to be on serving 'twentysomethings'.

This can result in products and services that while looking good may be daunting to use for the cash rich, but visually challenged over-45s[77], due to their small font sizes. Indeed tiny buttons and minuscule fonts may make some devices unusable for some people, perhaps unnecessarily restricting the product's target market.

The focus on younger customers can also cause the industry to design only for those who have grown up with technology. Yet anyone born before the 1970s is unlikely to have learned about technology in high school, while anyone born before the 1980s may have learned only a token amount of IT. Creating products and services that do not take into account older age groups' lack of familiarity with technology could restrict, unnecessarily, their available market.

Online content – a key reason for using the Internet – also appears skewed to a younger audience. Social networks, for example, appear designed for the young. But given the underlying need that social networks are addressing – communication with peers – they are as relevant for 50-year-olds as for 15-year-olds. The few cases of social networks aimed at older age groups appear to have been a success[78].

There are around 500 million disabled people around the world, many of whom appear to have been poorly served by the telecommunications sector[79]. Given that some products and services designed to be accessible to the disabled have become mass market successes, the potential of this market may have been overlooked.

For example, a large-button phone, specifically commissioned by UK telecommunications operator BT, with a remit to be accessible to partially-sighted people, became one of the best selling fixed-line phones ever sold in the United Kingdom[80]. The cassette tape was originally designed for the visually impaired as a more accessible alternative to the incumbent reel-to-reel tape. At the time of its introduction, the cassette tape was not expected to have mass market appeal as its audio quality was inferior to the reel-to-reel. Yet the success of the cassette tape and reel-to-reel's demise showed that the public generally places more emphasis on ease of use than on quality.

Bottom line
The telecommunications sector should increase its focus on developing accessible products and services. This could address corporate social responsibility objectives and also please financial stakeholders.

In developed economies, many telecommunications companies face growth challenges. Fixed broadband operators in several key markets are experiencing slowing broadband growth[81]. At the same time, while mobile operators in many developed countries have nominal penetration rates of over 100 percent, some individuals have multiple subscriptions, but up to 20 percent of the population have none[82].

Operators, as well as the equipment manufacturers that co-serve these markets, should understand why a significant proportion of the population is not yet connected. It appears that price is not the only factor[83].

Ease of use may be a stronger factor. In this regard, the telecommunications sector could learn some lessons from related markets. For example, device manufacturers could learn from some of the usability challenges encountered in the design of microwave ovens. One study found that people over 65 were more likely to use microwaves if they had rotary or slide controls rather than touch controls. Display panels were confusing and visual acuity diminishes with age[84].

Doing away with buttons and sliders altogether may also be an increasingly viable option. Mobile phones that use accelerometers and tilt sensors to respond to movement as an input medium are becoming more widely available[85], and other control mechanisms such as speech recognition and eye scanning can be increasingly robust and reliable.

Accessibility should be included at the design stage as retrospective adaptation may be too difficult to undertake. Making products easy to use may enable more than just a tick in the box for corporate social responsibility, it may also be good news for shareholders.

Prey becomes predator: the rising power of emerging market mobile operators

While the credit crunch may dampen the pace of mergers and acquisitions (M&A) activity in 2008[86], the will to grow via acquisitions is likely to remain strong in the mobile telecommunications sector.

During 2007, there were several instances of long-established operators purchasing stakes in operators in emerging markets. A key motivator for such acquisitions was to tap into growth. In developed countries, telecommunications is now often regarded as close to saturation point. For example, the nominal mobile penetration rate in a growing number of countries now exceeds 100 percent.

In 2007, over 70 percent of new mobile subscribers were expected to come from developing countries[87]. In 2008, new mobile subscribers in emerging markets may number almost one-third of a billion, more than all the mobile subscribers accumulated in North America during the 1990s[88]. More than a billion new mobile subscribers are forecast to be added in developing countries between 2008 and 2010[89].

Revenue per mobile customer in developing economies is considerably less than in developed nations, at about a quarter of the level. But EBITDA margins are consistently higher. Mobile operators can earn EBITDA margins in excess of 50 percent, despite monthly ARPU being under $10. At the end of 2007, the 10 mobile operators with the best EBITDA margins were all in emerging markets. In developed countries, average margins are closer to 35 percent, despite monthly ARPU of almost $45[90].

In 2008, acquiring or owning operators in emerging countries may provide more benefits than just revenues and margins. It may also help western operators learn important lessons relating to cost optimization. Operators in developing markets have, in some cases, already been obliged to build lean business models based on a few dollars of monthly ARPU. Some of the approaches used to minimize cost may become increasingly relevant to western operators in 2008.

However while established mobile operators in the developed world may be looking for acquisitions in emerging markets during 2008, the tables may increasingly be turned. Following a trickle of acquisitions by emerging market operators in 2007, players in these regions may become increasingly active predators, using their imposing market capitalizations, and in some cases cash piles, to acquire developed world operators.

A growing number of developing world mobile pure-play operators already have a market capitalization over $20 billion[91]. At the end of 2007, one had already exceeded the $100 billion mark, and one was worth over $350 billion, making it the largest mobile operator in the world[92].

Bottom line
Cellular mobile operations in emerging markets look set for high growth in 2008[93] and operators in developed countries should therefore move quickly if they wish to compete in these markets.

As time progresses the premium on any given target is likely to continue to rise[94], as interest from operators around the world grows[95]. Additionally, while on paper acquisition targets are plentiful, the number of opportunities may be reduced by the local legal, regulatory, financial and political systems, which could hold back or even block acquisitions[96].

Emerging market operators may be best advised to focus most of their attention on other emerging markets, rather than make a play in the developed world. Acquisitions in developed world economies may not create substantial value, at least until emerging market multiples exceed those of western operators. Given that the real growth opportunity lies in the emerging world, operators may achieve better results by focusing closer to home. However, selective acquisition of developed country operators may help emerging market operators to satisfy the debt markets that they are de-risking their portfolio of assets. Additionally, access to western debt markets via an acquisition could help emerging market operators lower their average cost of debt.

Both developed and developing world operators should take the opportunity to learn from one another. Western operators could, for example, learn from African and Asian operators' successful use of mobile phones for making payments and sending remittances[97]. And emerging market operators could learn how to avoid some of the issues that have plagued western operators as mobile markets have matured. Both, of course, should recognize that mobile's context in a developing country may be quite different compared with a developed market. Simple transplantation of products or services from the developed to the developing world, or vice versa, is not guaranteed to succeed.

Any operator with a presence in emerging markets should benchmark taxation levels for handsets and services against those of other countries. In developing economies, taxes on mobile services can be higher than for fixed. Mobile-specific taxes are levied in many countries: on average, taxes account for almost one-quarter of the cost of a handset, and these and other issues serve to suppress subscription growth[98]. Yet research suggests a link between increased mobile penetration and GDP growth, which in turn leads to growth in government receipts[99]. Addressing this situation will not only help operators to grow, but will likely also help to bring mobile communications to many of the people who need them most.

Questioning the need for speed

Speed is glamorous. But speed alone does not always coincide with commercial logic or market demand. The fastest car in the world[100], the fastest ever commercial airliner[101] and the most rapid commercial train service may never, when considered as standalone businesses, break even.

Speed also remains highly enticing for the telecommunications sector. In 2008, it is likely that many a trade fair and conference will have stands and sessions devoted to the wireline and wireless sectors' quests for speed. National and regional governments may also implore their telecommunications sectors to provide faster connectivity; warning that otherwise competing nations may surge ahead[102]. Equipment manufacturers are likely to launch, and continue research and investment into, products that can yield ever-higher speeds.

In the wireline sector, the current speed to beat is 100 Mbit/s[103]. In the wireless sector, the latest technology attains over 7 Mbit/s[104], itself faster than many of the wireline broadband speeds available.

The maximum available broadband speeds for fixed and mobile networks are likely to be, in 2008, far ahead of what was available 10 years ago. In 1998, dial-up dominated wireline Internet access, and offered 56 Kbit/s at best. As for cellular mobile, 9.8 Kbit/s was the most commonly offered speed.

The rapid adoption of fixed broadband appears to have demonstrated that there exists significant demand among at least 330 million households for applications and services that require more speed[105]. Extrapolating from this, it could be argued that while it may not be known today which commercially viable services will drive demand for 100 Mbit/s service, in 10 years' time, it may be questioned why the need for such speed was ever in doubt.

However take-up for mobile broadband appears to have been far slower. The bulk of revenues in the mobile sector, even in the most advanced countries, come from voice and data services supported by 2G networks. In 2008, while there are likely to be a range of networks and phones offering 7 Mbit/s, many of these may look little different from the voice-centered GSM phones available at the end of 2007. This would suggest that such phones, while supporting high speeds, may only occasionally be used for fast Internet connections.

But in 2008, with the shadow of the credit crunch possibly affecting investment decisions, there may also be a growing group of individuals who question the consumer need for faster speeds and the tens of billions of investment dollars this may entail.

Bottom line
The debate over how fast is fast enough in the telecommunications sector is likely to be as vigorous in 2008 as ever. But concerns over the cost of financing may cause telecommunications companies and their shareholders to question far more aggressively the business case for speed.

Telecommunications companies should be careful not to prioritize the quest for attaining the limits of what is technically possible over the need for profitability. Technology allows networks to stream multiple high-definition television channels via a telephone line, but in some countries this may not be necessary, given the existence of mature alternative infrastructures, such as digital satellite transmission.

Technology also allows the deployment of tiny cellular base stations, femto cells, to be installed in every house. The femto cell allows mobile subscribers to have a full 3G-type experience indoors, including access to mobile television and high-speed music downloads. But many households may already be content with music downloads via the fixed Internet and regular television service delivered to a large screen. Therefore the industry may be addressing needs that few consumers have.

The need for speed may always remain greatest in the wireline sector, where the functionality and physical size of the PC make applications, such as video streaming and other bandwidth-hungry services, practical. It remains to be seen whether mobile phones will ever need more than a modest amount of bandwidth, given their small screen and portability. And as with high-speed sports cars and other luxuries, should the economy shows signs of faltering, consumers may cut back their spending on both. At speed.


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GSM comes of age: adulthood brings challenges and rewards

On 7 September 2008, GSM comes of age.

On that particular day, the 21st anniversary of the launch of GSM, more than 700 GSM networks in more than 200 countries are expected to carry more than 16 billion minutes of calls and six billion text messages[106]. GSM's global subscriber base is forecast to have grown by 1.2 million[107]. More than six million GSM handsets are estimated to have been manufactured. The mobile technology is forecast to have generated $3 billion[108], or 1.36 percent of the world's daily GDP, which in turn should have yielded half a billion dollars in tax receipts for governments[109].

GSM's multiplier impact has also been substantial. Research has suggested that in the developing world, every 10 percent increase in mobile penetration results in a 1.2 percent increase in GDP[110]. Also, it is estimated that almost three million jobs are dependent on the mobile industry in Europe alone[111]. More than 20 of the companies in the Fortune Global 500 are either operators or manufacturers of GSM technology[112].

GSM's success has been achieved despite facing a number of significant challenges. It has outcompeted other digital cellular technologies, and by the beginning of 2008, was expected to have 85 percent of the market share[113]. GSM's size affords it economies of scale that help it fend off challenges from other technologies, from satellite mobile services to Wireless LAN.

It has largely absorbed the disruption of the 3G licensing process, which saw some operators investing tens of billions of dollars. And most significantly, it has coped admirably with its own success, with the GSM platform proving highly scalable for growth.

Now in its 21st year, GSM does appear to have been a resounding success story[114]. But as it comes of age, its outlook is expected to remain as challenging – and as rewarding – as ever.

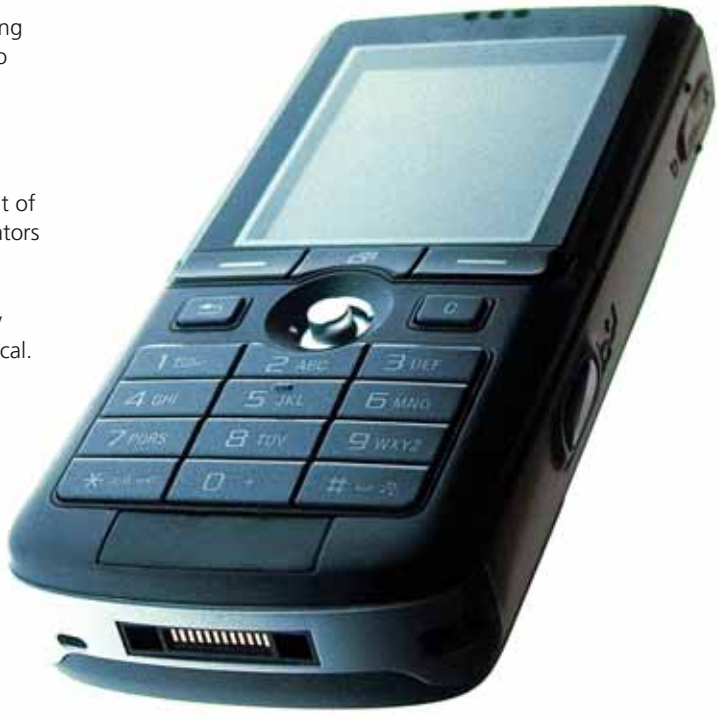
While the aggregate GSM subscriber base is growing, churn is a significant factor for many operators. On the single day of 7 September 2008, some operators may lose a third of a percent of their customer base to churn[115]. Over the course of a year, operators with this level of churn could lose their entire subscriber base. The cost of attracting new customers represents a considerable drain on operators' finances, and in some cases, an unnecessary one, as having a large number of customers may be uneconomical. Research has found that 20 percent of customers generate 80 percent of revenues[116].

GSM also faces a challenge over its future direction. The first generation of GSM technology has established itself as the workhorse for mobile operators around the world and remains a powerful cash generator. The question of where next for GSM may well remain unanswered in 2008. Some commentators have argued that 3G networks, based on the W-CDMA standard, are still not paying their way[117]. Customer adoption of mobile data services has been slower than hoped and revenue growth from data services has been minimal[118]. As a result, some operators have slowed down deployment of these networks[119].

Other operators have continued to upgrade their networks, deploying faster GSM-based technologies, such as HSDPA and HSUPA. However there is at present little clear evidence of a correlation between the speed of mobile networks and revenue growth[120].

Finally, in 2008 GSM is expected to face a number of regulatory issues. Regulators may continue to apply downward pressure on call termination charges, which could dent operators' revenues and profitability. Additionally, regulators' moves to liberalize the market for electromagnetic spectrum could, theoretically at least, give rise to new entrants in the mobile market. While their success is far from guaranteed, their very existence could have an impact on the stock prices of GSM operators.

One of the greatest threats to GSM's success in 2008 and beyond may come from GSM itself. Ever more aggressive price competition between operators may increase churn, implying higher commissions and subscriber acquisition and retention costs.



Bottom line
In 2008, GSM mobile operators should enjoy their historical triumphs but also prepare for the many challenges ahead. They should review strategies for every aspect of their business.

For voice, operators should hedge margin erosion by focusing less on price competition, and more on brand, quality and supplementary services that increase value, such as voice mail, voice-to-text, text-to-voice, multiple lines and others.

Operators should consider GSM technologies within their broader social context. In other words, they should examine the situations, processes and interactions in which GSM technology can be profitably applied, rather than focusing on the number and diversity of services that can be crammed into the mobile device. This approach is likely to be relevant in both the developed and the developing worlds. In the developing world, for example, GSM networks have been adapted to handle electronic commerce in a way that fixed networks simply cannot replicate[121] – and to great success. Similarly, GSM technology could find substantial opportunities in the machine-to-machine market, where small packets of data are unlikely to need the higher bandwidth of 3G networks to get to their destination.

The most complex and confounding issues will focus on data, with the biggest challenge for operators being how to encourage customers to use more data. Partnerships may well be key. Mobile operators could, for example, turn to providers of commercially successful content services.

Additionally, operators should reduce the complexity of 3G mobile phones to encourage customer adoption. One in every seven new mobile handsets is returned to the store by a customer, who is convinced it is faulty, even though it is not[122]. This 'no fault found' phenomenon is indicative of the complexity of newer mobile applications, and the wide-ranging issues that GSM operators will have to address if contemporary technologies are to succeed.

GSM may have been a gifted child, but in adulthood it is likely to need to mature quickly, develop new relationships and skills, and work like never before to stay on top.

GSM's success has been achieved despite facing a number of significant challenges. It has outcompeted other digital cellular technologies, and by the beginning of 2008, was expected to have 85 percent of the market share.

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Glossary of technical terms

2G	Second Generation Mobile Network
3G	Third Generation Mobile Network
ARPU	Average Revenue Per User
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
FMC	Fixed Mobile Convergence
GPS	Global Positioning System
GSM	General System for Mobile
HSDPA	High-Speed Downlink Packet Access
HSUPA	High-Speed Uplink Packet Access
IM	Instant Messaging
IPTV	Internet Protocol Television
IT	Information Technology
LAN	Local Area Network
PSTN	Public Switched Telephone Network
TMT	Technology, Media & Telecommunications
VoIP	Voice-over-Internet Protocol
W-CDMA	Wideband Code Division Multiple Access
WiFi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access

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