
The German government's auction of UMTS licenses was so costly that it will make the carriers' current business models unsustainable. Most business models on the Internet are already questionable, and many have already collapsed. So when UMTS weds mobile communications with the full weight of the Internet in 2002, two huge industries with busted business models will be thrown together. Will anyone be able to spin gold in this market?

Mastering the Mobile Internet

What are the killer applications for GPRS and UMTS?

... and who will make the killing?

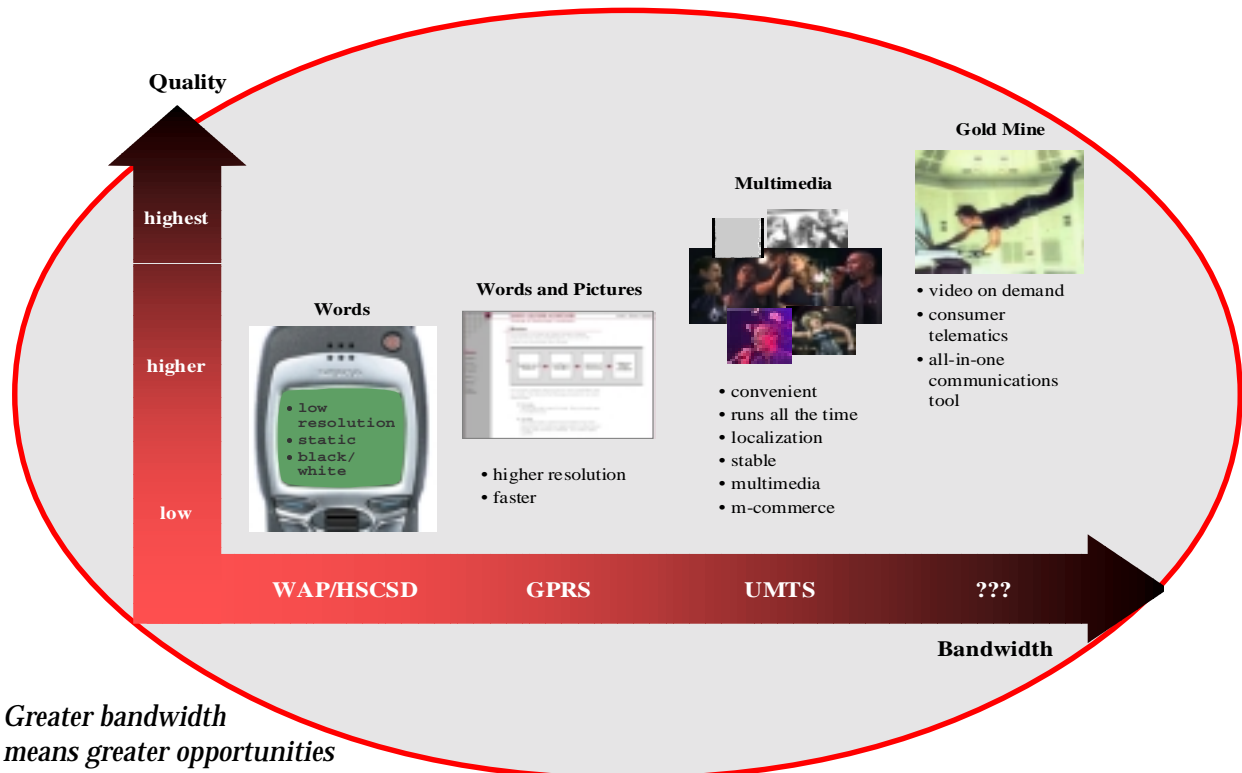
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The emergence of UMTS (Universal Mobile Telecommunications System) in the next few years will create the first opportunity for tens of millions of ordinary Europeans to remain "turned on" and "tuned in" to the Internet 24 hours a day – and in contrast to WAP, actually enjoy the experience. While other interim technologies such as GPRS also offer the "always on" feature to mobile phone users, comparing them with UMTS is like comparing the picture on a small black-and-white TV screen with the quality of larger, color image.

As hordes of technicians begin erecting new telecommunications masts throughout Europe, marketing and R&D departments all around the world have begun to wrestle with two fundamental questions:

- What will all those UMTS users be doing?
- How can companies profitably charge them for it?

The two questions encapsulate the future of the telecommunications industry. Consider for a moment what is at stake. The *Economist* estimated in December 2000 that the total cost for the transition to third generation mobile phone systems - including the cost



for licenses and equipment - could exceed \$300 billion worldwide. The answers to those two questions will determine how a pot of money approaching one trillion dollars will be shared.

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What will the UMTS users be doing? Where are the killer applications?

The professional segments certainly have the most immediate demand for the benefits of UMTS and the money to spend on it. But over the long term, professional segments will not bring the payback the carriers need. Furthermore, the carriers will not have the luxury of time. They can't use the business segment as a testing ground before slowly rolling out consumer products. Without a mass consumer mar-

ket, all those telecommunications masts will become lasting reminders of how "technological greed" - the desire to realize a technical wonder regardless of the cost or the market - can prompt investment in solving problems which don't exist.

Why is this so urgent? Let's do the math for Germany. The average revenue per user (ARPU) in Germany is currently around \$300 per year. The introduction of the i-mode mobile Internet service in Japan initially boosted average bills by 20-25%, so if we are generous, we can say that ARPU in the early days of UMTS will be \$400 per German user. If we earn 10% before interest and taxes, that's \$40 per user or a profit of \$160 million if you have 4 million users. So far so good.

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Now let's look at interest payments, the hangover from the UMTS license auctions. For the German carrier with 4 mill. customers, interest payments will be \$100 per customer, or \$400 million per year. That not only obliterates our profit, it also represents a whopping 25% of our *revenues*. What does this mean? It means the carriers need to extend their business models far beyond the system of having people pay for connection charges.

But how much, and for what? At first, the carriers can offer the compulsories — bread-and-butter applications such as news, sports, and personal finance, which provide a solid basis to establish UMTS as a consumer medium. But these applications can hardly be described as breakthrough or a killer. Nor are they necessarily profitable, especially on the information side. The *Wall Street Journal* is the rare shining example for successfully charging people for an on-line news service, but the price is still a small fraction of the newspaper version's. Other information services depend on advertising, and that market is very sluggish at the moment.

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So where are the killer applications for UMTS? It would help to understand what a killer application actually involves. We admit that it is easier to describe killer applications than to develop them.

What unique elements do "killer" success stories like the 3M Post-It note, the Sony Walkman, and the Pokémon phenomenon all share? First, for lack of a better word, killer applications are "cool". Take the example of cars and horses. What was the car's com-

petitive advantage in 1899? Both cars and horses had a frustratingly limited range, needed to be fed constantly, and behaved erratically. They needed to be housed and bathed, and they stank. But novelty and technological fascination combined to make the car "cool" compared to horses. The exhilaration of speed, the desire to be progressive, and a perception of freedom and release helped the car make headway against the horse as a primary mode of transportation.

This gives rise to six characteristics for killer applications:

Mass appeal. They invariably have a large following, even if it takes some time to build. The product itself could ultimately be tailored to different segments or distributed via different outlets, but it must have some fascinating or unifying element which attracts a very large following. This thinking was central to the decision of the late Steve Ross to combine Warner Brothers with Time, Inc. in 1989. The new AOL Time Warner is now well positioned to use its media positions - in film, television, movies, music, and Internet - to create a multiplier effect for its rights to the *Harry Potter* films.

High frequency. Killer applications get used, the more often the better. They have either a high repeat value or undergo rapid changes, which makes them addictive to many people. As advertising pioneer Albert Lasker said about disposable tissues in the early 1900's, you know you have the right product combination when people stop paying attention to how many they use.

Accessibility. Killer applications are push-button or turn-key. Activating them requires little or no effort. Nowadays, most children learn to use a Walkman, a microwave oven, a video recorder, a video game console, a CD player, and a personal computer before they ever see the inside of a classroom. Why? Because there are no barriers to accessibility. Once tried, their use becomes immediately obvious and natural.

Affordability. Once Henry Ford turned the Model T into a product his own line workers could afford, the prospects for the automobile changed permanently for the better. The boom could begin. In 1905, three years before the Model T was introduced, the United

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In the UMTS world, what could be described as cool, popular, addictive, simple, affordable, versatile, and self-reinforcing? This question has three answers:

Games, messaging, and e-mail



As of mid-January 2001, the i-mode service from NTT DoCoMo had 17.76 million subscribers.

States had around 75,000 registered automobiles. By 1910 the number had increased six-fold to 450,000, and then by 1915 it had risen again five-fold, to 2.3 mill. vehicles. This represents a compound annual growth rate of 40 percent over a 10-year period, the kind of growth rates the UMTS carriers will need to approach in order to survive.

Versatility and variability. Killer applications evolve, becoming increasingly rich and complex over time without losing their core simplicity and appeal. Take the *Pokémon* example. From its roots as a low-priced Nintendo Game Boy cartridge, *Pokémon* has become a billion-dollar business supported by trading-card games, other Nintendo video games, merchandise, films, and one of the world's most popular children's television cartoon series. A little Pikachu goes a long way.

Self reinforcement. This aspect is a kind of corollary to Metcalfe's law, which says that the value of a network is dependent upon the number of users. In his book "The Road Ahead", Bill Gates referred to this phenomenon as a positive spiral, as usage begets usage.

The insidious killer: Games

In the world of UMTS in Europe, what could honestly be described as cool, popular, addictive, simple, affordable, versatile, and self-reinforcing? If the success of i-mode in Japan is any indication, this question has three answers: games, messaging, and e-mail. In announcing a deal with Japan's NTT DoCoMo and Italy's Telecom Italia Mobile (TIM) in January 2001, Dutch carrier KPN stressed precisely these applications. The trio expects to have products available in Germany, Italy, and the Benelux countries in the second half of 2001, when GPRS handsets become more widely available.

Games: When philosopher Johann Huizinga nicknamed our species as *Homo Ludens* ("Man the Player") back in the 1930's, he could not have known that he would be foretelling the future of telecommunications in the early 21st century. Bosses who saw the *Tetris* craze of the 1990's give way to the *Moorhuhn* fascination of today will consider any escalation of the availability, appeal, and playability of on-line games to be a nightmare scenario. But carriers who

ignore or dismiss this trend risk being outflanked by companies who already make popular, Internet-friendly devices and also market increasingly more sophisticated games to go with them. The Sega Dreamcast and the soon-to-be-available Microsoft XBox show how intense the battle for online interactive gaming has become.

Video games now easily draw in more money during the winter holiday season than movies do. The game market is estimated at \$20 billion worldwide, making it already half as large as the market for recorded music. But they thrive on a sense of community which makes issues such as pricing and billing even more sensitive.

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Messaging and e-mail: No matter how you define messaging or e-mail, its addictive power is overwhelming. Living without SMS (short messaging service) would be social suicide for many young people in Europe and Japan. But messaging takes many forms. If you consider file-swapping services such as Napster, you see the economic potential buried within messaging communities. In less than 18 months, Napster accumulated almost 50 million users, who swapped an estimated 1.6 billion MP3 music files in November 2000, according to Webnoize. This puts the trading volume on Napster at about 10% of the volume on the New York Stock Exchange. That's a heady combination of popularity and power.

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What else is out there which could be killer? Restaurant guides and videos certainly do not belong on the list. The former is a cute idea, but the effort to realize it does not justify the costs. And that counts in spades for videos, but this is largely a technical issue. Do you really think that an industry which still cannot maintain a decent voice connection within a moving train for longer than a few minutes will suddenly be able to pipe *Star Wars* into that small device in your hand?

Divining other as-yet-unknown killer applications will require carriers to carefully segment their potential UMTS customers and make sure their size, eagerness, and willingness-to-pay justify the costs involved in offering the service. In other words, they need to take the focus off technological daydreams and place it squarely on the needs and wishes of customers who will ultimately pay the bills.

These answers are linked to some degree to the devices people will prefer when the Internet goes mobile. Will the mobile phone expand its range of uses to become a personal digital assistant (PDA) and an MP3 player, or will the PDA turn into a true telephone. Or will people still prefer to do "real surfing" and game playing on their laptop and ignore the bells and whistles UMTS can offer? Will children call their parents on their Nintendo GameBoy or someday play Pokémon on their mobile phones? Will tomorrow's children even know the difference, or care?

Why should the Internet suddenly change the way people have eagerly consumed mass media over the last 100 years?

Carriers still need to turn a profit

Running a few focus groups or relying on gut feeling is not sufficient to determine which direction or directions this market will take. The required analysis is much more complex. Carriers need to take several steps in order to develop a sound business model which gives them a strong, eager customer base and a road to profitability. There are three major areas which carriers need to address.

Content Strategy: That may rank as the most misunderstood phrase of the last couple of years. The discussion became muddled the moment that someone decided that content could suddenly be sold piecemeal, with customers paying directly and consciously for the content they consume. Why should the Internet suddenly change the way people have eagerly consumed mass media over the last 100 years? It can't and it won't.

With the exception of the rare modest success in pay-per-view television or video-on-demand, nobody in the developed world is accustomed to paying for individual pieces of "content". When we buy a newspaper or subscribe to a magazine or cable TV, consumers buy a complex, carefully planned and consistently executed *bundle* of content. With radio or broadcast TV, we don't even pay at all. Yet companies who offer these bundles of content have made fortunes.

Content strategy means developing a mixture of content pieces which both generate traffic and keep people "tuned in", what the Internet world calls stickiness. Newspapers have used comics as an important traffic booster for over 100 years, but have used other types of articles - features, separate magazines, stories ranging from one paragraph to several

pages - to achieve the stickiness which all suppliers of content crave. Television networks in the United States have used sports as a traffic booster for decades, a sort of loss leader to draw people into other types of programming. Even supermarkets have figured out what many Internet companies haven't, namely, that you offer a mix of staples like milk and meat in the back of the store, use loss leaders as traffic boosters, and use the rest of your floor space to increase shopping time, or stickiness.

The mixture of voice and data under one roof opens up a much broader range of revenue streams which carriers can tap.

What many companies have lacked in their attempts to deliver online content is this kind of holistic view, the common-sense comprehensive view that says the Internet is a media like any other. The media needs to be easy to use and understand, to offer a systematic bundle of content at a reasonable price, and use that mix of content to both attract and hold people.

What does this mean for the carriers? They need to start thinking of the Internet as a traditional medium like newspapers or magazines, and put a similar infrastructure - with editorial management teams, development and design teams, and relationships to other content providers - into place. They also need to think in terms of revenue when they plan and assemble their content bundles.

There is no single traffic booster, nor is there one isolated revenue stream on which the carriers can reliably focus.

Revenue Models: Even when the mobile Internet carriers have their mix of content in place, they still need to generate revenue. How will the customers pay? Revenue models are based on a combination of subscription and usage, with time - months for fees and seconds or minutes for usage - as the common parameter. The mixture of voice and data under one roof opens a much broader range of revenue streams which carriers can tap. Orange, the UK-based carrier which is currently part of France Telecom, is already developing revenue models which assume that the old voice model - subscription and usage - will play a less important role. These new revenue streams include advertising, sales commissions, and additional services along the lines of an ISP, e.g. storage space, personalized website, additional e-mail addresses.

There is no single traffic booster, nor is there one isolated revenue stream on which the carriers can reliably focus. They need to consider all possible revenue streams, and also understand how these various streams work together.

Guesswork, gut feeling, and cost-plus approaches to pricing become much more dangerous in this kind of environment, which calls for the optimization of prices.

Pricing: In our paper on "Selling Music Online," we said that price is a dangerous lever, and that music companies have little room for error. The same applies for telecommunications companies, who run the risk that the price levels - and the enormous profit potential - in their industry will be decimated by competitors who use price as their traffic builder instead of quality.

Finding the right price levels and tariff structures will require the carriers to move beyond time-focused thinking and into value-based thinking. Take Napster, the online platform for swapping MP3 music files, as an example. What tradeoffs are users making - and what costs are they incurring - in order to get "free music"? We have estimated their out-of-pocket online charges alone at over \$1 billion annually. The time Napster users lose due to re-booting or interrupted downloads is harder to calculate, but probably also staggeringly high.

The chat rooms show that Napster users value their community - their opportunities for interaction - almost as much as their music. Furthermore, they express a willingness to pay for secure connections, variety, availability and convenience.

Mobile phone carriers face an analogous situation when they offer Internet services. Their challenge lies in converting these value parameters into money terms, and finding the right way to extract that value.

This complexity will place extreme demands on the carriers' ability to fine-tune their pricing. Guesswork, gut feeling, and cost-plus approaches to pricing become much more dangerous in this kind of environment, which calls for optimization of prices. The only way to do this with any precision is to understand the full value of the online products and the online experience from the customers' point-of-view.

Summary:

1. **UMTS carriers face extreme pressure from shareholders, banks and the public.** They absolutely must know what their users will be doing and how they can profitably charge them for it.
2. **Carriers need to extend their business models far beyond connectivity.** Otherwise they sacrifice their stake in the larger market.
3. **Carriers need killer applications.** Bread-and-butter services like news, sports and personal finance are not enough.
4. **Killer applications have six things in common:** Mass appeal, high frequency, accessibility, affordability, versatility/variability, and self-reinforcement.
5. **Games, messaging, and e-mail currently have the highest potential as killer applications.** All carriers need to differentiate themselves in these areas.
6. **Carriers must segment their markets carefully.** Size, eagerness, and willingness-to-pay have to justify the investments carriers will make. The focus must be on customers, not technological possibilities.
7. **People are accustomed to buying bundles of content, not individual pieces.** UMTS carriers' content strategies must reflect this, because the Internet is just another medium.
8. **Stop searching for the one and only revenue model.** Carriers need to draw revenue from many streams in the future.
9. **Pricing must be value-focused, not time-focused.** The challenge lies in converting that perceived value into money.

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