BIG TALK

THE $116 BILLION BUSINESS OF SELLING CELL PHONE CALLS IN THE U.S. FACES A LONG, UGLY DECLINE. THAT PETRIFIES JUST ABOUT EVERYONE IN THE INDUSTRY EXCEPT ROGER LINQUIST. BY SCOTT WOOLLEY

WITH HIS GRAY HAIR AND GRANDFATHERLY DEMEANOR, ROGER LINQUIST hardly seems like the kind of guy to kneecap a $116 billion industry. Yet the 71-year-old chief executive of MetroPCS cheerfully and brazenly promises to do just that. He aims to bring down the lucrative business of selling cellular phone calls, a business that for four decades has grown bigger and richer with every passing year.

MetroPCS, which Linquist founded 15 years ago, is now the fifth-largest cell phone network in the U.S.—a distant fifth behind the giants that dominate the business: Verizon, AT&T, Sprint Nextel and T-Mobile. Linquist argues that his upstart company's $3 billion in revenue and 3% market share give it

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Talk is cheaper: MetroPCS founder and Chief Executive Roger Linquist vows to slash the price of cell phone calls.

MICHAEL THAD CARTER FOR FORBES

the freedom to remake the industry. He means to help turn cell phone calls into just another cheap digital commodity, the same fate that has already befallen the rest of the phone business and doesn't much care what happens to his giant rivals in the process.

The Big Four are scrambling to offset any drop in calling revenue by shifting their focus to new wireless opportunities. They are just beginning to spend tens of billions of dollars deploying new "fourth generation" cellular technology to greatly expand their data-moving capacity and make all sorts of new wireless devices possible, from e-books to dog collars that let you track Fido's whereabouts. Linquist just signed contracts to buy the same 4G technology for a very different reason: He plans to use it to radically improve his ability to carry phone calls—and do it much more cheaply.

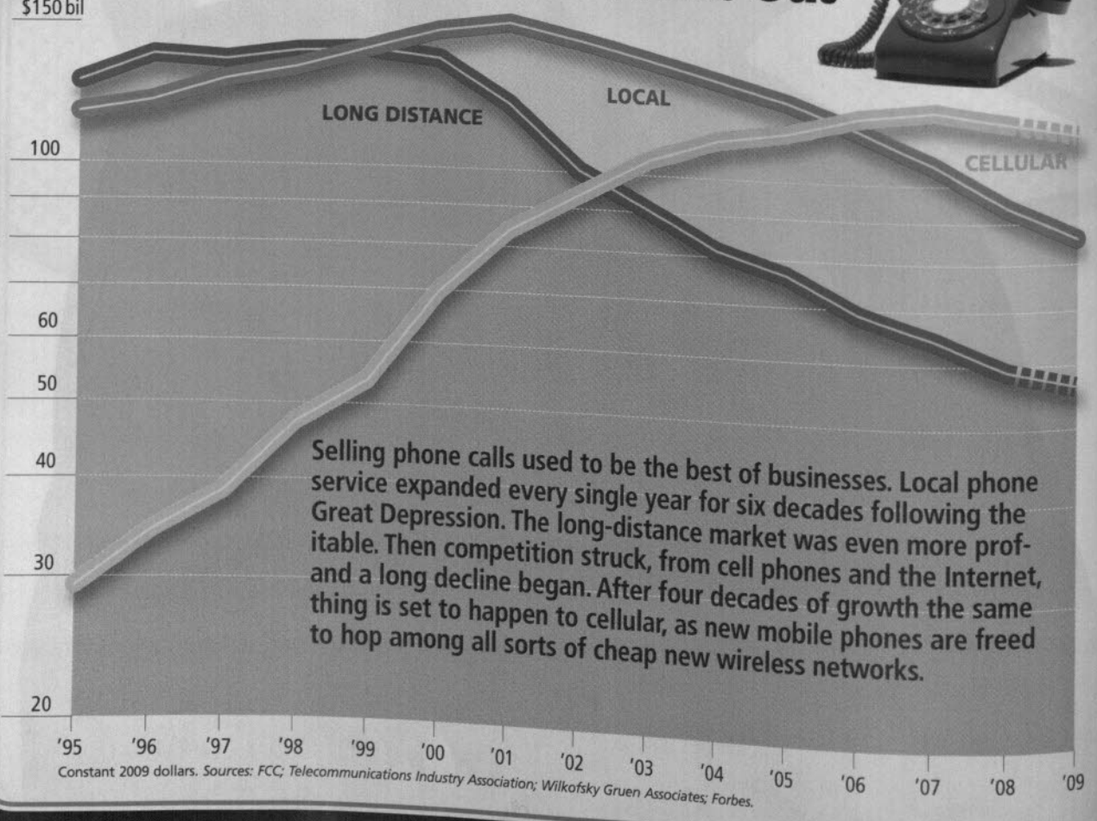
A DECADE AGO THERE WERE THREE PHONE BUSINESSES: LOCAL, LONG DISTANCE AND CELLULAR. THE FIRST TWO HAVE ALREADY COLLAPSED.

"Commodity—as distasteful as that word might be, there's opportunity there," Linquist says, contemplating the coming apocalypse with a smile. "Our anchor is that as long as we have a substantial cost leadership position we know we're not just a survivor ... we will thrive."

The new gear is so powerful that he will be able to simultaneously increase the quality of cell phone calls *(see box, p. 102)* while cutting the cost of providing each minute, from just under a penny today to closer to a tenth of a cent. Linquist charges 2.1 cents a minute, just under half of the industry's average revenue. He'll continue cutting, confident his singular focus on running the cheapest voice network will keep his costs well below those of the rest of the industry.

A decade ago there were three phone businesses: local, long distance and cellular. The first two have already collapsed, done in by advancing Internet and cellular tech-

Voice Fades Out



Selling phone calls used to be the best of businesses. Local phone service expanded every single year for six decades following the Great Depression. The long-distance market was even more profitable. Then competition struck, from cell phones and the Internet, and a long decline began. After four decades of growth the same thing is set to happen to cellular, as new mobile phones are freed to hop among all sorts of cheap new wireless networks.

Constant 2009 dollars. *Sources: FCC; Telecommunications Industry Association; Wilkofsky Gruen Associates; Forbes.*

nology and the cutthroat competition they unleashed. Americans paid $110 billion annually for long-distance phone calls nine years ago. It's now down to $55 billion and still shrinking. Local phone companies took in $126 billion at its peak eight years ago; that sum has fallen to $86 billion and is dropping fast.

To date the cellular calling industry has been immune from the commoditization infecting the rest of the phone business. Today's Big Four carry more phone calls than ever (almost 2 trillion minutes last year) and took in more money doing it than ever before ($105 billion). Collectively they control 90% of the U.S. market, and this cozy oligopoly hasn't succumbed to ruinous price wars—yet. Over the past three years, for instance, the four giants hiked the price of single text messages from 10 cents to 15 cents, and then to 20 cents, despite the lack of any plausible link to their underlying costs. (That encouraged customers to opt for all-you-can-text flat rates, boosting industry profits.) The lockstep price increases sparked a Senate investigation of the Big Four's market power, but they remain in effect.

THE CELLULAR INDUSTRY'S MAGIC FORMULA RELIES ON DEMAND GROWTH, BUT IT'S NOT THERE ANYMORE. WITH PRICES FALLING, THAT MEANS THE FIRST EVER DROP IN REVENUE.

When Linquist looks at that sort of pricing he sees not strength but weakness. Modern cell phones can do thousands of things, from downloading TV shows to finding the nearest Korean restaurant. Nevertheless, the cellular industry still makes almost all its money charging for just two applications: making phone calls ($116 billion) and sending text messages (roughly $12 billion, the carriers won't give exact figures). Everything else is considered generic "data." All of those thousands of other uses, many of which put much greater strain on the network than calling or texting, bring in the remaining $20 billion in revenue.

Linquist, a former analyst with McKinsey & Co., argues that the barriers to competition that have long insulated the market are eroding. In the past the cellular giants have been able to rely on the scale of their nationwide networks to limit competition. They also kept an iron grip on what their customers' phones could do—but now consumers are wresting that control away.

Apple first loosened the industry's hold two years ago when it persuaded AT&T to let iPhone owners download all sorts of software enhancements. AT&T consented, but didn't give up full control, requiring the software be screened before it went on sale. It banned applications that let customers make phone calls using their cellular Internet connection, and for an obvious reason: In both the local and long distance phone markets, customers' ability to route calls over the Internet helped new competitors savage prices.

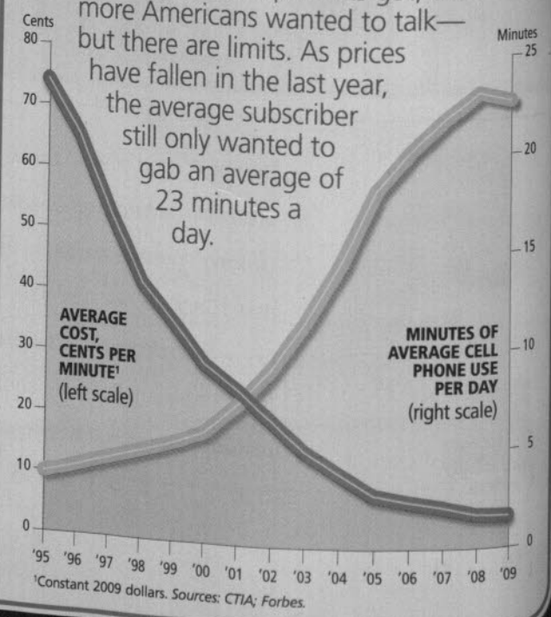
Having tasted freedom, users began to expect more control over their handsets. Politicians in Washington jumped in, arguing that wireless consumers need their help to break free of phone company shackles. In September the new Federal Communications Commission chairman, Julius Genachowski, made a splash by launching a public push for regulations mandating freer phones.

In October AT&T caved in to consumer and political pressure and lifted its blockade of Internet calling software. The market chopped 2% off AT&T shares the next day, but Ma Bell's competitors followed suit anyway. Verizon announced it will release new phones that its subscribers will be able to customize in almost any way they please. Vonage, which specializes in shifting calls from traditional home phones to the Internet, unveiled similar software for the cellular world that can run on a BlackBerry.

Linquist thinks the idea of legislating "open" phones is a waste of time and potentially counterproductive. The mar-

Talked Out

Since the dawn of the cell phone industry, the cheaper calls got, the more Americans wanted to talk—but there are limits. As prices have fallen in the last year, the average subscriber still only wanted to gab an average of 23 minutes a day.



[1]Constant 2009 dollars. *Sources: CTIA; Forbes.*

ket is moving that way anyway, he argues. "You just can't argue with open access," he says. "Consumers are going to get devices that do what they want them to do."

Once that happens it will unleash a new era of price-cutting, Linquist believes. Liberated phones will hop off the cellular network whenever there is another wireless network around that's able do the same job at a lower cost. Already many of today's wireless gadgets can communicate via either a 3G cellular network or a Wi-Fi network. Tomorrow's phones will hopscotch to electronic formats with names like Long Term Evolution, femtocellular and Wi-Max.

LIBERATED PHONES WILL HOP OFF THE CELLULAR NETWORK WHENEVER ANOTHER WIRELESS NETWORK IS AROUND THAT CAN HANDLE THE SAME JOB AT A LOWER COST.

As choices proliferate, the cellular market will begin to look a lot like the local and long-distance markets, places where new competitors and new networks can rip giant chunks of share from dying oligopolies. Least-cost routing is common practice in the rest of telecom, Linquist observes, so it's only natural it'll eventually invade the wireless world, too. That's fine with him: It's exactly the world he's been designing MetroPCS to dominate.

Roger Linquist has been entranced by the power of digitally driven price cuts ever since the 1970s, when he worked for Texas Instruments on some of the earliest commercial calculators. A midwestern boy who studied rocket science at Purdue, Linquist became fascinated by the puzzle of how to run a business in which costs fell exponentially. In the days when almost no one had heard of Moore's Law, he vividly remembers his boss holding up an early version of a pocket calculator. "He said, 'This thing that costs us $120 today will sell for $10 in three years.' At the time it was such a profound thought."

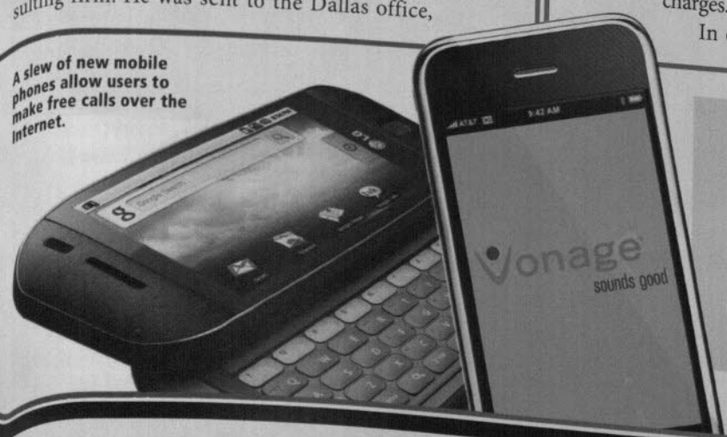
Linquist eventually left to work for McKinsey, the consulting firm. He was sent to the Dallas office, where many of his clients were telecom companies. In the mid-1980s he helped file some of the first-ever applications for cellular licenses, which the FCC was simply handing out for free to whomever it considered to be most deserving. Intrigued by the potential of the wireless market as costs fell, Linquist decided to try his hand in what was then considered an equally high-tech wireless business: paging.

He saw the paging market as ripe for digital disruption. At the time most paging services refused to let customers own their pagers and would only rent them out as part of a service contract. Pagemart, which he founded, let people buy their own pagers and simply sold them service for $7 a month. That was a huge saving over the $20 a month customers paid for service and the rental. As the price of the pagers fell to $100, subscribers started saving money in less than a year.

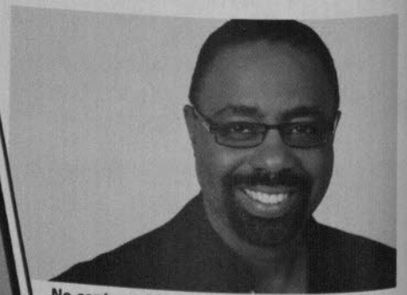
Paging turned out to be a profitable but limited market, so Linquist lifted key parts of his business model and set out to attack the booming cellular market, founding MetroPCS in 1994. Just as in paging, the cellular companies insisted on subsidizing their customers' handset purchases. To make that money back, carriers locked subscribers into long-term contracts with overpriced service. Linquist did away with contracts—along with several other common industry practices.

Unable to compete directly with the scale of the giant national networks, he decided to serve only the places where cell phone use was the highest, namely cities. MetroPCS started service in Atlanta, Miami, San Francisco and Sacramento. If his subscribers wanted to travel outside of those cities' limits they would have to pay roaming fees, an anachronistic notion in an industry in which the big guys prided themselves on having a national footprint free of such charges.

In exchange for that limitation, Linquist



A slew of new mobile phones allow users to make free calls over the Internet.



No contract, big opportunity: Sprint's Boost Mobile President Matthew Carter Jr.

offered unlimited talk for a flat monthly fee of $40. Today his model is beginning to take over the industry. This year, for the first time ever, companies like MetroPCS added more new no-contract subscribers than the big four carriers signed up with contracts. To compete, Sprint launched its unlimited no-contract offering in January, under the Boost Mobile brand name. Verizon jumped in, too. To stay ahead, MetroPCS and its nearest peer, Leap Wireless, cut prices of their unlimited service to $35 a month.

The price war rages on. Last month AT&T introduced its first unlimited, no-contract plan. Five days later Wal-Mart announced it would start selling the Tracfone brand (which uses the Verizon network) nationwide. It includes an unlimited plan for $45 and a new 1,000-minute, 1,000-text plan for $30. The industry is nervously awaiting an announcement from T-Mobile, which has traditionally been a price leader but has yet to enter the unlimited, no-contract fray.

Matthew Carter Jr., the president of Boost Mobile, says he expects no-contract carriers will eventually take over most of the market. He figures that riding on Sprint's networks gives him a big advantage over MetroPCS by sidestepping complicated restrictions on roaming. "We're going to play the game of simplicity," Carter says. "When you go to buy a Boost, it's a 30-second conversation."

Linquist's plan for MetroPCS goes far beyond undercutting prices of Boost. The long-term shift in the wireless market is from selling specific functions (like calls, text and e-mail access) to selling a generic digital connection that customers can use for whatever they please. Since all communication has gone digital, there's no real difference in moving a cellular phone call, a bit of text or a newfangled application.

That's why the ex-McKinseyite pays attention to strange measurements, including what he calls "bits per cubic meter." The idea, he explains, is to identify different locations, like apartment buildings, where demand is highest. Next he figures out how to fill that demand as cheaply as possible. As for places where demand per cubic meter is low and cost of service is high, like rural areas, he'll let someone else provide coverage.

MetroPCS has pioneered the use of new technology that lets it pack more bits into high-traffic areas. On a recent afternoon in East Los Angeles, dozens of parents waited to pick up their kids from school, many chatting away on their phones. While most calls linked invisibly to large cell phone towers, the MetroPCS subscribers unknowingly connected to a tiny antenna no bigger than a car radio antenna that dangled from a nearby telephone pole. From there the calls traveled via fiber-optic cables that snaked alongside old phone wires back to a dingy building and then to the main network. These clever minicells are only one way the company keeps chopping the cost of providing each customer with unlimited calls. Providing unlimited calls now costs the company $16.82 per customer per month, down from $18.23 a year ago.

The long-term industry evolution Linquist describes sounds more revolutionary than it is. Throughout their history cellular networks have been built mainly to handle phone calls and have used a separate network to carry all other data. That will change with the advent of 4G, the first generation of wireless network built as a data network. To a 4G system, a phone call is just another application.

IN THE PAST CELLULAR GIANTS KEPT AN IRON GRIP ON WHAT THEIR CUSTOMERS' PHONES COULD DO. NOW CONSUMERS ARE WRESTING THAT CONTROL AWAY.

John Donovan, AT&T's chief technical officer, draws a parallel between the cellular and wired worlds. In the early 1900s there was a phone network, and it could carry only phone calls. Then the network learned how to carry a little bit of data masquerading as a phone call (remember the sound of the dial-up modem?). Next, the phone network learned to carry voice and data at the same time (on a "digital subscriber line"). Finally, there will be only a data network, capable of handling digitized voices or anything else.

So far the cellular industry has survived each price cut with no discernible damage to the top line; volume expanded faster than prices shrank. In the mid-1980s calls cost a dollar a minute. Today the revenue is much bigger at a price of a nickel.

That magic formula relies on demand growth, which isn't there anymore. Last year was the first in the history of the industry in which the average cell phone subscriber talked less than he had the previous year. The influx of new subscribers is declining, too. New customers are tough to find in a market where nine of ten Americans already own a cell phone.

In the past 12 months Americans gabbed on their phones for 2.2 trillion minutes, a 3% increase from the prior year (due to a small uptick in mobile users). That's way down from the 30% growth the market has long been used to *(see chart, p. 96)*. It's very likely that this year will be the first in which total talk-time plateaus. With prices falling, that means the first ever drop in revenue.

WIRELESS WIPEOUT

The biggest carriers have experience with this sort of problem. AT&T and Verizon have just finished a remarkable transformation. In the course of a decade they went from relying mainly on local phone lines to relying mainly on cell phone service. Yet while they survived the metamorphosis, it has been wrenching. In the past decade shares in AT&T and Verizon are down 43% and 55%, respectively, compared with a 12% drop in the broader market.

Cheap wireless connections will spawn myriad new uses beyond phone calls, but of course no one knows how big the data market will turn out to be. Linquist graciously wishes the best of luck to the four big wireless providers in making up lost voice revenue with sales of new data services. He's just not betting his own house on any such bonanza. **F**

Get Ready for Hi-Def Phone Calls

Radio ads running in the former Soviet republic of Moldova feature a variety of emotional phone conversations, evidence of how the world's first high-definition cell phone system can carry not tinny-sounding speech but voices full of raw human feelings: love, fear, exhilaration. "You can feel emotions; it is completely different," says Liudmila Climoc, chief executive of wireless carrier Orange Moldova.

For 40 years the quality of cellular phone calls has changed very little. The shift in the 1990s from analog to digital phones held the promise of crisper quality, but that never panned out. Struggling to cope with 30% annual increases in traffic, cell phone companies used the improved technology to add capacity, not quality.

Today demand for cellular minutes is nearing its peak, with growth of 3% in the last year. Now the relentless advances in digital technology can be used for purposes other than simply packing more calls into the cellular airwaves.

So far the big American carriers plan to use their growing capacity to add all sorts of data services. Eventually the U.S. will catch up to Moldova, as the cost of better-sounding voice calls becomes too cheap to ignore. Today's carriers convert calls into 6,000 digital bits per second, a tight squeeze and the major reason the calls sound so poor. In tiny Moldova, where capacity is relatively abundant, French wireless carrier Orange now uses double that number of bits. The highs and lows of the human voice are not so badly truncated.

In the U.S., chipmaker Broadcom is hard at work on gear that will allow even better-sounding calls. Nambi Seshardri, who oversees that work at Broadcom, says that with 32,000 bits per second he'll be able to produce voice quality that is virtually indistinguishable from face-to-face conversation. A demo of the technology shows a clearly audible improvement over not just ordinary cell phones but also landlines, which chop off high frequencies.

The other big problem with cellular quality is also about to disappear. Right now there's an annoying lag that occurs between the moment when one caller speaks and the time his voice reaches the other person's ear. Many people assume that's an inherent drawback of cell phones. It's not. Wireless signals fly through the air at the speed of light just as they do in optical fiber. The delays come from slow software and circuitous routing. The new Long Term Evolution gear set for deployment next year should cut that lag by at least 75%, so most human ears won't notice it.

The same quality advances are at work in wired phones as well. Orange already has 500,000 high-definition phones installed in Europe that use voice-over-Internet technology. When this style of phone connection hit the scene it was roundly criticized for its poor quality relative to traditional phone lines. Yet Orange has shown that better technology can close that gap and then some. Both cellular and Internet phone calls may soon sound so good it might even make you want to cry.

—Scott Woolley

I *Can* Hear You Now!

A quick look at how the problems with today's cell phones will soon be fixed.

PROBLEM: "TINNY" SOUND.
To save capacity, today's phones drop high-pitched sounds. The letters "f" and "s" sound similar, and "p" is easily confused with a "t."

SOLUTION: More capacity, less compression. New networks that begin rolling out next year can triple the number of bits a call uses, leading to better-than-landline sound.

PROBLEM: POPS AND CLICKS.
Cell phone calls are often interrupted by peculiar, and annoying, sounds caused by the connection briefly failing and tiny snippets of speech getting lost.

SOLUTION: New chips from Broadcom integrate "packet loss concealment," letting the phone fill in the small gaps with less grating sounds.

PROBLEM: WIND NOISE.

SOLUTION: Clever software that identifies wind noise and suppresses it.

PROBLEM: OVERLAPPING SPEECH.
Talk from one cell phone to another and you notice a big lag between when you speak and the other person hears you, often leading to overlapping conversations.

SOLUTION: The next generation of cell phones is designed to waste less time transmitting calls and to eliminate any noticeable latency.