

Contact

WINNER
GULDBLADET
2009
Best Redesign



Vendors' and operators' common goal

All-IP for the people

Pages 16-25



**JOSEPHINE EDWALL, GLOBAL SERVICES,
HEAD OF COMMUNICATIONS.**
"In five years, we will be the natural
first choice for our customers"

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How they work:
SMART
ANTENNAS

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Meet telecom
legend Sunil Mittal

Pages 32-34



BUSINESS TRIP



PHOTO: OSKAR KIHLOF/ERICSSON RACING TEAM

In 9 months we have visited our customers around the world and stopped in Spain, South Africa, India, Singapore, China, Brazil, USA, Ireland, Sweden and Russia.



Ericsson Cables & Interconnect in Hudiksvall

Calling in on the cable factory

Pages 26-30



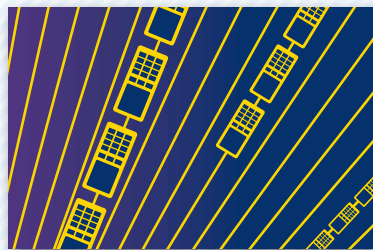
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Contact

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Your magazine needs you!

Communicating verbally can be difficult sometimes, but I wonder if written communication isn't even harder. Just think how difficult it can be to put an e-mail together. Something the sender feels is patently obvious can mean something completely different for the recipient. Producing an entire magazine such as Contact, in which images, design and articles have to work together, is not a walk in the park, but it is often a lot of fun. It is especially exciting when you, our readers, get in touch with constructive criticism and praise. We have received a lot of recognition from you since we launched Contact with its new design and reworked content a year and a half ago. Easier to read, better content, more fun, better looking and easy to handle have been some of the most common comments – something that is gratifying when you consider that this was what we wanted the redesign to achieve.

Contact recently won the Guldbladet award for the best redesign of 2009. Guldbladet is Sweden's leading industry competition for staff, association and corporate magazines, and we see this recognition as further proof that Contact is providing really good quality. But we naturally want the magazine to be even better. At the start of the year, we introduced Contact Newsletter, an electronic bulletin that complements the magazine. Our aim is to tie the magazine and our intranet closer together, and for that, we need your help. Keep sending in your views about our articles, and give us suggestions for feature articles or other items you want to see in Contact. The e-mail address as always is contact.comments@ericsson.com. It is difficult to take the magazine further without your help. I am convinced that a world-class company deserves a world-class magazine.

In this issue, we spend a lot of time looking at all-IP. Where is it heading? What do operators need? Which of Ericsson's products and solutions are customers interested in? A new, wide-ranging survey, done by Ericsson together with the operators, shows clearly, with specific figures, that it is profitable for operators to invest in mobile broadband. We give you the main findings in this edition of Contact.



Henry Sténson, head of Group Function Communications and publisher of Contact

Have your say

E-mail us your questions, opinions, reflections or work-related images. We will publish a selection of the material on this page.

contact.comments@ericsson.com

A TELECOMMUNICATION ICON

Regarding the article "Speakerphone was the boss's favorite" in Contact January 2009 Ericovox in Brazil was referred to by the nickname, "JK's telephone." The official Ericsson name of Ericovox in Brazil was "Ericofon." But when the Brazilian capital was moved from Rio de Janeiro to Brasilia in 1960, the President, Juscelino Kubitschek, who built the new capital used an Ericofon to inaugurate Brasilia's telephone

system at that time. We can say that "Ericofon" or Ericovox was an Ericsson telecommunication icon here!

Edgar De Moura Guimaraes, Brazil

WHY A PRINTED MAGAZINE?

I wonder why we are still getting a paper copy of the magazine while there is already a PDF file on the intranet. This is a time when everybody talks about the environment and cost reduction. It would be more reflective of the Ericsson brand if you invested in a user-friendly web publication rather than printing a magazine.

Ivy Li, Sweden

ANSWER We look in to this every now and then, but since our readers

appreciate a paper magazine, (according to the polls we've done) we will keep it. Also, our experience is that we can reach more readers when delivering a printed magazine that employees can read when commuting or having a break. Since last year, we print the magazine on environmentally friendly paper and have decreased the distribution, which reduces negative effects on the environment. We have also started distributing Contact as a digital newsletter every second issue, which gives us the ability to stimulate reader dialog and make it possible to reach readers who prefer to read Contact digitally, and save some money at the same time.

Malin Nordén, in charge of editorial channels

Readers' pictures



This is the view that we have when waking up at my uncle Little Cookie's place in São Francisco Xavier, São Paulo, Brazil. I took the picture with my W910 phone.

Reinaldo César de Moraes, Brazil



These are brave fishermen arriving at the beach after a hard working day. This picture was taken during my holidays in Fortaleza, Brazil.

Henrique Guimarães, Brazil



Here I have captured my son while he was playing and jumping off a park bench. Slightly difficult to shoot but I managed to catch him mid-air along with the shadow!

Deepak Gujar, India

Web poll

51%

...of 1543 Ericsson-employees have a positive experience of mobile broadband. Almost 40% answer that they don't have access to mobile broadband.

Welcome...

PHOTO: MIKE TAYLOR



...to Ericsson, Banyana Foba.

In February Banyana Foba joined the HR department for Ericsson in South Africa, based in Johannesburg. She currently is spending most of her time trying to understand the business and its structure, who fits where and

what value they add.

What would be you dream project?

"That would be working with Transformation, a project that will begin to position Ericsson as a great place to work as well as a

leader of transformation in the African context."

What did you do just before you started at Ericsson?

I was with Toyota in South Africa, responsible for human resources and dealer network training.

Have you been asked ...

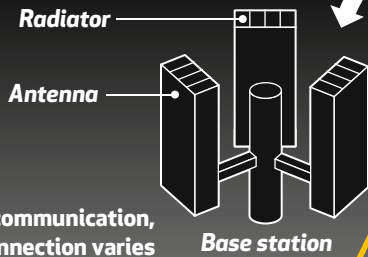
...ABOUT SMART ANTENNAS?

Smart antennas

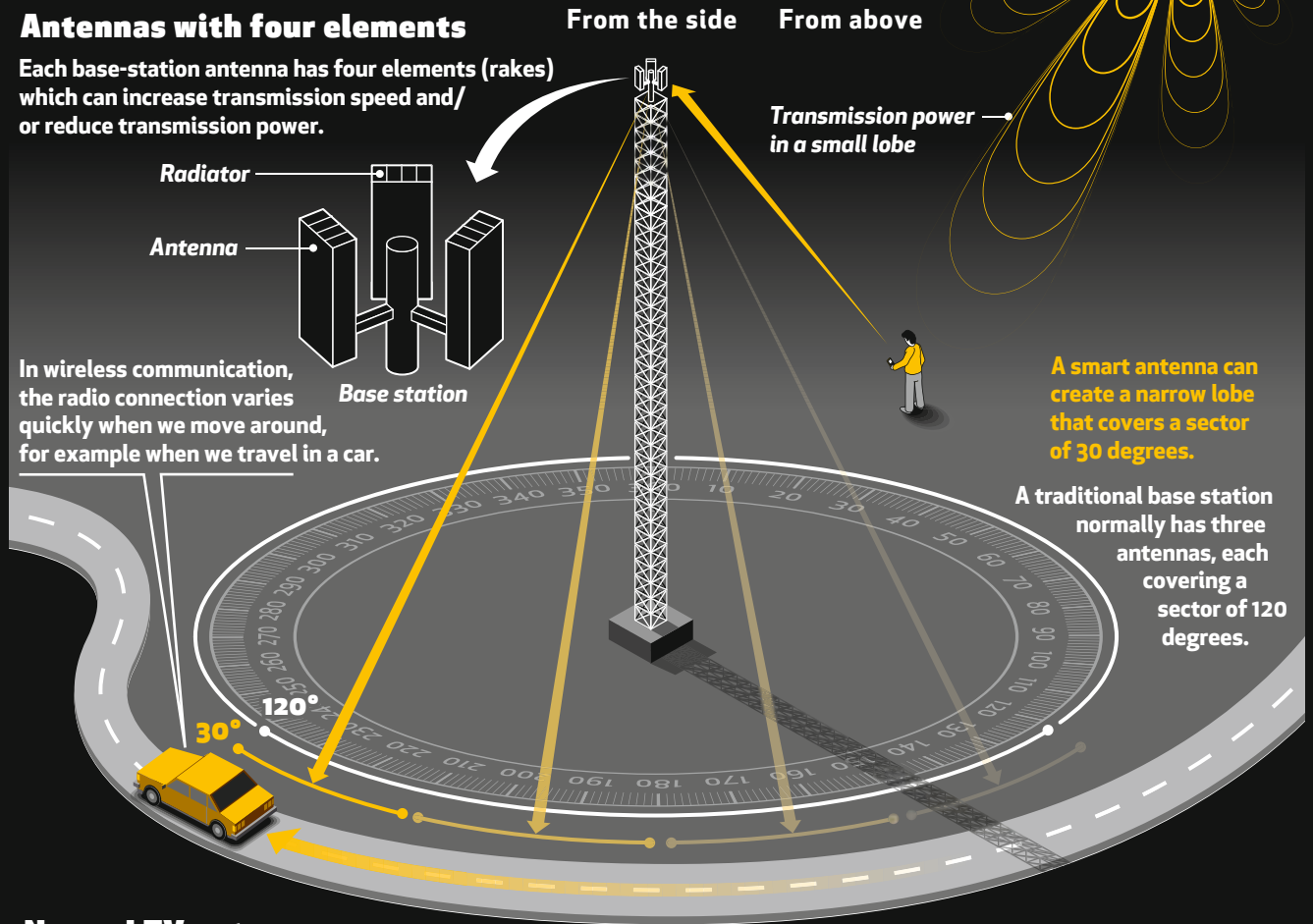
With more antennas, the transmitter can beam energy in specific directions, in contrast with today's antennas, which transmit in all directions.

Antennas with four elements

Each base-station antenna has four elements (rakes) which can increase transmission speed and/or reduce transmission power.



In wireless communication, the radio connection varies quickly when we move around, for example when we travel in a car.

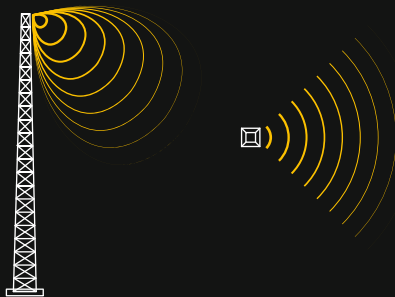


A smart antenna can create a narrow lobe that covers a sector of 30 degrees.

A traditional base station normally has three antennas, each covering a sector of 120 degrees.

Normal TV antennas

These transmit their energy in all directions within a 120-degree sphere. They are used for TV broadcasting.

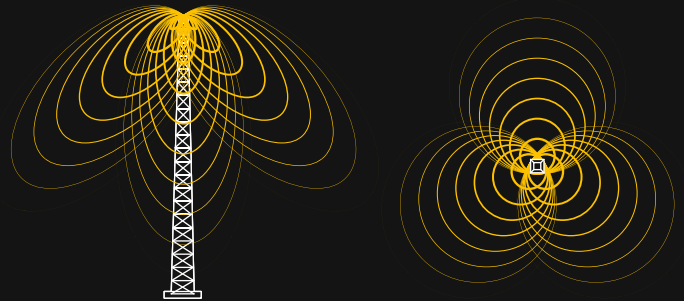


From the side

From above

Traditional base stations

These are used in mobile systems and are most common today.



From the side

From above

Icy site

Winter temperatures can fall to minus 40 Celsius at this site, on Greenland's Sanderson Hope mountain. It belongs to TELE Greenland, part of the operator's transmission network, which stretches along the west coast of Greenland. The service technicians who visit the site, with its Ericsson-delivered equipment, have to use a helicopter to get there. A one-bed heated shack next to the site allows a technician to stay for a few days if the weather deteriorates. The site is at latitude 72° 45' 14" north and longitude 56° 04' 55" west. The closest town is Upernavik, about 10km away.

PHOTO: THOMAS VANGSKJAER



4pm / October 14, 2008 / Sanderson Hope, Greenland



Google mobile to Europe

ANDROID Smart mobiles are all the rage this year. In June, Samsung is releasing its Android mobile i7500 in Europe, writes Swedish daily Aftonbladet. The telephone's features include a 3.2-inch AMOLED screen. AMOLED is a variant of OLED, a screen technology that gives superior picture quality, contrast and lighting compared with regular mobile screens. The phone also comes with built-in GPS and supports WLAN and HSPA with speeds of up to 7.2Mbps.

Bing to lift Microsoft

SEARCH SERVICES Bing is the new name of Microsoft's upgraded search engine, which is intended to increase the company's market share, writes Ny Teknik. The new search engine categorizes results into topic areas. This saves time for surfers, as they do not have to enter precise search terms. The previous version of Microsoft's search engine is in fourth place with just over 8 percent of the market.

Samsung gains ground

REPORT Analysis firm Gartner writes in its latest report that sales of mobile phones fell by 8.6 percent in the first quarter, compared with the same period in 2008. But there was one winner – Samsung gained on industry leader Nokia.

▼ MOBILE-PHONE SALES IN THE FIRST QUARTER OF 2009 (MILLIONS)

1. Nokia	36.2
2. Samsung	19.1
3. LG	9.9
4. Motorola	6.2
5. Sony Ericsson	5.4

A day for looking deeper

Mobile health and cloud computing were two of the topics highlighted at Ericsson Research Day, in Stockholm.

RESEARCH Presentations on mobile health, or mHealth, showed how mobile systems can support medical treatment. Peter Håkansson spoke about how people in developing countries can get inexpensive support using their mobile phones. This can include using a camera phone to photograph skin disorders, which then can be diagnosed by medical staff, or to gather data on and chart deadly illnesses such as tuberculosis and malaria.

The right resources Per Karlsson explained the term “cloud computing.” New applications

can access common server resources over the internet on, for example, Google and Amazon, or a telecom operator. Software developers can then supply the application on a larger scale and get the resources they need.

“Cloud computing is here and now, and Ericsson is participating in projects in California and in the EU,” Karlsson says.

Vulnerable platforms Security is becoming increasingly important, and has become a research area in its own right. András Méhes spoke about how vulnerable the technology platforms are, and how a network can never really be secure if the platforms are not safe. The threats come from



Peter Håkansson at the demo station.

both software and direct physical attacks.

Per Fröjdh took a look at how a combination of technologies is bringing three-dimensional images to life. And Martin Körling

spoke about Ericsson Labs and an external website where external developers can give feedback and talk about their work on beta tests for real customers.

✉ Lars Cederquist

“Brand orientation answers the two basic questions that all companies wrestle with better than any other management tool: how can we create satisfied customers and how can we get staff on board to achieve this goal?”

Frans Melin is an associate professor at Lund University, one of the Nordics' leading brand strategy researchers and consultants, and head of the Brand Orientation Index research project.

By the way...

NOTED ... **Business Unit Networks** is changing its measurements global mobile broadband, from the number of users to the number of broadband-adapted devices. ... **a pilot for the global HR Contact Center** kicked off in Kista recently. It covers Denmark, Finland, Norway, Estonia, Latvia and Lithuania, where the concept will be evaluated. ... **Ericsson** employees

have submitted more than 3500 suggestions for the Sustainovate competition. Market Unit India & Sri Lanka tops the list with more than 600 entries. Three winners will be named in June. ... **the telephone** number for Ericsson's internal switchboard in Sweden is 17000. ... **India** has got its first Tower Tube, in Hyderabad.

NEW CONTRACTS

► **Denmark.** Ericsson has signed a contract with Danish operator Faroese Telecom to build and maintain a WCDMA/HSPA network for both the 2100MHz and 900MHz frequencies.

► **Sweden.** Ericsson has signed a contract with the municipality of Hudiksvall to develop and manage an operator-neutral city network in Hudiksvall. The open-network broadband solution allows residents to select individually

adapted services such as high-definition IPTV and video-on-demand.

► **Turkey.** Ericsson has signed a four-year contract with Turkish operator Avea for an HSPA network. Avea will be able to offer its 12 million subscribers multimedia services and access to the internet via high-speed mobile broadband.



PHOTO: PERNILLE TOFTE

Behdad Banian says that Ericsson has a strong position in the market, but that it must work to improve credibility in areas where it has ambitions.

New brand strategy to match new needs

Ericsson is working on a new brand strategy in order to gain credibility within new business areas.

STRATEGY Behdad Banian, director of Brand Management, says Ericsson has a strong position in the market.

“Ericsson is the technology leader in mobile infrastructure,” he says. “We’re also known for being reliable – we always deliver. We’re one of few companies that can really say we are global – we are in all the markets where we do business. And we have strong relations with the world’s biggest and most successful operators.”

The telecom industry is looking at how to change and improve itself, for example by taking advantage of the opportunities that the rise of a sustainable society offers. Many see telecom as a way to

change how the world generates financial growth. Banian says this shift “gives Ericsson as a leading player a solid platform to build on.”

“But not everything is positive,” he says. “In recent years, our margins have fallen; operators have become bigger and become tougher buyers, and this is putting pressure on prices. The competition in the market is also getting tougher every day.”

Improving credibility

The Ericsson brand – how the company is perceived – fits in with its position as the technology leader in mobile infrastructure. Banian says Ericsson needs to work on improving its credibility in many areas where it has ambitions, such as the broader portfolio. Ericsson therefore has to create a brand that not only focuses on the company’s ambitions, but that also

turns these into reality. Banian says the branding project has been working with Ericsson’s extended management team for the past year.

“We’ve defined Ericsson’s most important strengths and, even more importantly, the strengths we must have if we look five to 10 years into the future,” he says.

Launched during GMC

“We believe Ericsson’s central strength is our power of innovation and ability to let this benefit our stakeholders. We

have that ability thanks to our employees and their expertise. In the long run, we believe this improves people’s lives and the world around us. We’re going to give our customers the best we have so that they’ll be even better and go even further.”

The new brand strategy was recently launched at the global conference for Ericsson’s top managers, the GMC, and will come into fruition internally and externally in the next two to three years.

Key stages for a successful brand strategy

- ▶ The strategy should be in line with the company’s overall strategies. They can then feed off each other.
- ▶ Develop a system to look after the brand. It allows you to manage and carry out necessary changes in a structured manner.
- ▶ Build the brand from inside the company by focusing on the employees. In this way everyone will be an ambassador for the brand.

Source: Behdad Banian

Hello...



... Frans Melin,

assistant professor at Lund University in Sweden, who is behind the Brand Orientation Index research project, an initiative that takes a close look at the link between brand orientation and profitability. **Why is it important for companies to focus on their brands?**

Your brand is a way of reaching your goal. The goal is to achieve a better result through a strong brand. We conducted a research project a couple of years ago examining the 500 largest companies in Sweden and found that the companies that were the most brand-oriented were also the most profitable.

What signifies a strong brand?

A strong brand is well-known and produces a positive association. A strong brand means that what the company does is recognizable. Another dimension involves happy and loyal customers. We talk about the will to recommend the company. You can look at it from a customer’s perspective – would the customer want to recommend the company? It can also be a sign of strength from an internal perspective; would employees be willing to recommend the company? **Are some industries better than the others?**

The consumer products industry has always been very good at working with branding, but in recent years B2B companies have become increasingly aware of the importance of a strong brand.

☒ Cia Kilander

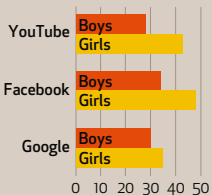
Contact praised

COMPETITION Contact has won the Sveriges Uppdragspublicister's prize at Guldbladet 2009 in the category of best redesign. The jury deemed that "a sober but at the same time pleasant design and a personal tone adds to the magazine's makeover. The spread of articles is well chosen and highlights different parts of the company around the world. The complete package breathes solidarity and commitment for a common goal. In short, the magazine has been radically transformed for the better." Malin Nordén, head of Editorial Management at Ericsson, said: "It is great that we won; we will continue to work for improvement and development in our editorial channels."

Most popular teenage sites

INTERNET These are probably YouTube, Facebook or Google. According to a survey by Youth Trends, these websites had the highest visitor statistics for young people in 2008.

▼ VISITS PER WEEK IN PERCENT, 13-17 YEAR OLDS



Nickel levels high in phones

REPORTS Some telephones from Samsung, LG, Sony Ericsson and Nokia emit excessive quantities of the metal nickel, which can trigger allergies. The worst offender is Samsung's L700, which emits 40 times more nickel than EU limits.

Source: The Danish Ministry of the Environment.



PHOTO: ERICSSON

Ericsson Research labs has a host of live demonstrations for next generation broadband access, such as VDSL2 (shown in the photo) and world's first 10-GPON demo.

Broadband efforts paying off

Ericsson's recent ground-breaking high-speed broadband live demos have made customers eager to find out more about what is cooking in Ericsson's Research labs.

RESEARCH Inviting customers to the labs is an excellent way for Ericsson to give an extra dimension to business discussions. Ericsson's research labs now have

a host of demos for next-generation broadband access.

Two years of hard work Hans Mickelsson, head of Ericsson Research Broadband Technologies, says: "Two years of hard research work is now paying off. We have a good base in all wireline access areas that we will continue to develop."

Ericsson received

great industry attention in March when it announced that it had conducted the world's first live demonstration of Very High Speed Digital Subscriber Line 2 (VDSL2)-based technology, achieving data transfer rates of more than 500Mbps.

More confidence

Customers interested in Ericsson's state-of-the-art demos for next-

generation broadband access can be invited to any of the research labs in Kista and Mölndal in Sweden, Pisa in Italy and San José in the US.

"We believe it gives customers confidence in our work, showing in practice our deep knowledge about and commitment to the broadband access area," Mickelsson says.

✉ Lena Widergren

Market Unit that twitters

NETWORK Barack Obama, John McCain and Oprah Winfrey all twitter. The micro-blogging trend is growing rapidly and in April, the number of unique users increased to 20 million, Svenska Dagbladet reports. The value of blogging as a marketing channel is not being missed by Market Unit South East Europe, which is the first market unit to jump on the

twittering bandwagon. During its marketing and communication campaign Broadband on the road – which aimed to increase knowledge about the MU's broadband offering – a special profile was created on Twitter, where customers, the media and employees can follow the campaign.

Go to: <http://twitter.com/broadbandwithus>

✉ Cia Kilander

PHOTO: CHRIS PIZZELLO/SCANPIX



Oprah Winfrey – one of the many twitter users.

New way of working increases sales

He noticed something that could have been a footnote in the minutes of the meeting. Instead, it became a deal worth hundreds of millions of Swedish kronor. And all it took was a conversation with a sales colleague.

COOPERATION Meet Miguel-Angel Sanchez, customer project manager at the Global Service Delivery Center in Madrid, who is an expert in Sales Opportunity Generation.

Sales Opportunity Generation is a new way of thinking about cooperation. When Sanchez describes the method, it sounds simple and obvious. "It is about being open, about seeing what we as engineers can contribute," he says. "It is primarily what we can discover and offer customers to improve their network."

A new way of thinking
This new way of thinking and working began at the GSDC in Madrid in 2007. The program, aimed primarily at engineers with in-depth technical competence working within the delivery organization, helps them work more actively to find what can be improved in a customer's network. If they identify an improvement, they pass the tip on to a salesperson at the market unit, who then contacts the customer. The engineer can then be

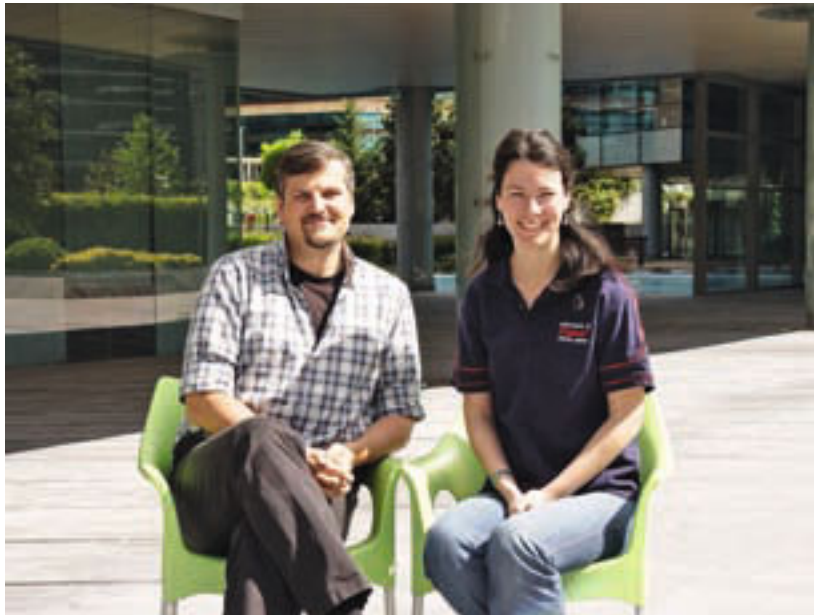


PHOTO: JAVIER PESINI

Miguel-Angel Sanchez Serrano and his colleague Bianca Belzuzarri, who together secured delivery of the solution, in record time.

available as support for the entire sales process, if required.

For engineers within the delivery organization, this is all about a new way of working. Previously, a work order would come in from a market unit for a specific job to be done. The engineers then installed and configured the network.

"We did the job, and that was that," Sanchez says. "We didn't think so much about what could be improved – not like in this case, when I suggested a brand-new solution, Abis over IP + LCF (a new IP-based technology), which our customer Digicel wanted."

Kriengsak Bunpuck-

dee, who worked at Market Unit Central America and was part of the sales team for Digicel at the time, says the help they received from Sanchez and the GSDC in Spain was essential for success.

"Miguel-Angel started and supported the project in technology terms from beginning to end. It was a very close relationship and we worked in partnership. We didn't

have much time. Digicel wanted the solution as quickly as possible and they were happy when everything worked," he says.

Apart from a satisfied customer, the Digicel deal became a deal worth hundreds of millions of kronor. The Sales Opportunity Generation program undoubtedly has potential.

✉ Cia Kilander

This is Sales Opportunity Generation

- ▶ It is aimed primarily at the global and local delivery organizations and also affects sales teams in the market units.
- ▶ It is part of the Service Delivery Maturity Model (SDMM) targeting Operational Excellence in Service Delivery.

"Microsoft is a good example. Lots of Microsoft people blog. They are really enthusiastic about what they work with. By writing about their jobs in a dialog on the web, it is more likely that they will have more fun at work."

Peter Parkes from the London-based bureau We Are Social, talking about social media at InternetWorld.

Hello...



... Peter Källgren, who is running the Ericsson Roadshow.

What are you doing?

We want to get closer to our customers and we feel that by inviting them to visit a special truck with our latest and best products, solutions and services is the best approach. We are inviting people to attend interesting seminars that focus on what we can do, even in areas where customers have never expected anything from us. Our leading solutions will leave our customers astounded.

What is new this year?

We are traveling to some new regions. In total, we are visiting 28 countries and nine market units during 2009. The Mobile World Congress in Barcelona was a great experience and we will try to offer those who have not taken part in it to have the same experience in our truck. Another new aspect is that we have a larger selection of product demonstrations and seminars.

What has been improved?

We are seeing an enormous difference in how prepared the market units are this year. They have really supported the concept and realized the opportunities it provides. They are really doing a good job and using this platform in the best way.

✉ Cia Kilander

Hello...



... **Hanna Bergman**, won the Swedish Royal Institute of Technology's Future Female Leader Award as the most prominent female technology expert in 2008. The award included an internship at a company of her choice. Bergman chose Ericsson.

Why did you choose Ericsson for your internship?

For many reasons. Ericsson has a good reputation as an employer. Previous winners chose Ericsson and have decided to stay on afterwards, so I wanted to try it myself. Ericsson is a major company and I am curious about how it works. The international atmosphere is also attractive. Even though I know little about networks, they influence my working day and I want to learn more. I believe in simplifying communications between people.

What do you expect out of your internship?

To get an overview of Ericsson as an organization. I don't know much about the industry, so it will be exciting to see what Ericsson actually does.

What do you think you will be doing in five years?

I hope to have a job that makes me happy. So far I have a vague idea of what that could be. The internship will give me an opportunity to see what I'm good at and what suits me. My list for the future includes working abroad. That would be fun.

☒ Cia Kilander

NEW METHOD CUTS LEAD TIMES IN HALF

Ericsson's cable factory in Hudiksvall produces fiber and copper cables for everything from radio base stations to the transport network for broadband and Fiber-to-the-Home. Work began on changing production processes when it became apparent that they were inefficient.

OPERATIONAL EXCELLENCE Kalle Jonsson, Supply Operational Excellence, has been working with change at Ericsson Cables & Interconnect for several years.

"It was difficult to get an overview of the whole process, and there were long waiting times. We decided to try lean production methods, a Western interpretation of the philosophies behind the Toyota Production System. Put simply, it's about getting more value out of each

link in the production chain."

Lead times today are down to 10-12 days from the previous 25-40, primarily thanks to the first-in, first-out principle and Visual Mapping Systems, showing how visualization can improve production.

Large whiteboards at several places around the factory allow workers to follow the whole production process and make notes if they see something going wrong so they can get help from their colleagues.

"Even though it has been a rough ride, it now feels like we can harvest the fruits of our labor with lean production," Jonsson says. "We needed to make changes to be competitive. The system is under constant development and we will fine tune as required."

☒ Hendrik Bergstén



PHOTO: BODIL BERGGVIST

Kalle Jonsson with one of the big whiteboards around the factory, where employees can keep track of the whole production process.

Several important targets are:

- ▶ Base decisions on long-term planning.
- ▶ Use visual control so no problems are hidden.
- ▶ Create continuous process flows to bring the problems to the surface.
- ▶ Use reliable and well-proven techniques that suit the employee and the process.
- ▶ Spread the workload.

Read more about the Cables & Interconnect factory in Hudiksvall on pages 26-30.

Brazil meets Mother's Day demand

SUPPORT Things got really busy recently for Ericsson's customer support center in Brazil, which helps operators manage their mobile networks. The reason was Mother's Day (May 14) – one of the biggest holidays in the country. One of the most popular gifts on Mother's Day is a mobile phone, and operators competed fiercely for Brazil's 103

million mobile phone users with a myriad of attractive offers. One major operator in particular lowered the cost for every text message sent by 20 percent, according to technology site, Cellular News. But such situations are hardly unique to Brazil. Ericsson's customer support teams around the world are increasingly feeling pressure during

holidays. Danilo Rubio, from Ericsson customer support



Danilo Rubio

in Brazil, explains how his unit prepared for the holiday rush. "Early on, we did an analysis of the periods during which traffic is greatest in the network, including Mother's Day. After reviewing the networks,

we put together a databank, Knowledge Centered Support (KCS), to track the most commonly-occurring problems. In it, we included instructions to solve these problems. Then we put together an on-call group of three to four people who would be available around the clock to help our customers."

☒ Cia Kilander

Fast work for Verizon

Time was tight when Verizon Wireless said last August that it wanted capacity and coverage plans for its LTE test network within two months. But the Ericsson TEMS experts finished the job in time.

INNOVATION Ericsson uses the TEAM tool CellPlanner to design the radio part of GSM and WCDMA networks. And now it needed the same planning functionality for LTE, more than a year before the first commercial network was to be built. The customer project in Dallas, USA, needed to deliver the plotting maps to Verizon in mid-October. Dag Bernheim, head of TEMS R&D in Kista, is pleased with his unit's efforts.

Intensive work
"We got the requirements from Verizon at the end of August," he says. "By reprioritizing our work, we managed to produce a TEMS



PHOTO: PERNILLE TOFFE

Some of the TEMS experts who worked hard to meet Verizon's urgent demands for a TEMS CellPlanner beta release that supported LTE. From left: Fredric Kronestedt, Maria Thiessen, Johan Isaksson, Nikus Nordling and Alexander Lindquister.

CellPlanner beta release with LTE support very quickly. This was done in cooperation with many units at Business Unit Networks."

There was close cooperation with Anette Borg, senior R&D specialist at BU Networks, and the Scenario project at the development unit. The results in TEMS CellPlanner were compared with the LTE result produced in the Scenario project's simulation tool. Gavin Saldanha from Ericsson's sales office in Dallas visited Sweden in early October to produce maps of the test system

together with the TEMS unit. LTE requires advanced planning algorithms, examining where users are situated and how much traffic they create. TEMS CellPlanner simulates the radio network and enables the user to decide where base stations are needed and whether advanced antenna systems are required to gain sufficient capacity.

Good result
"The challenge was in understanding the essential aspects of the new LTE technology and

which parameters are important in calculating capacity and coverage," says Astrid Wastegård, product line manager at TEMS. Since then, TEMS CellPlanner's result has been tested further through drive-test measurements. The first TEMS investigation for LTE suggests a strong correlation between the results from the simulations and reality.

At the Mobile World Congress in February, Verizon announced it had chosen Ericsson as a primary vendor for LTE.
Lars Cederquist

THIS IS TEMS

The TEMS unit, part of Ericsson for many years, will move to Switzerland-based Ascom on June 1. Ascom will enjoy a key partnership with Ericsson, which guarantees TEMS products' early access to Ericsson's leading-edge technology and infrastructure innovations.

Thank you for your compassion

The family of Jan Embro would like to sincerely thank all the Ericsson staff and management worldwide for their

condolences, thoughts, prayers, and support for the bereavement of a dear father, husband, champion and leader. Jan is

missed and will continue to be in our hearts and minds forever.
Najla Naim

Prized button

INNOVATION Everyone who has used a mobile is familiar with little button with a green handset on it. The engineer who created the world standard for this button, Laila Ohlgren, has been awarded the Polhem prize by Sveriges Ingenjörer. The prize is worth SEK 250,000.



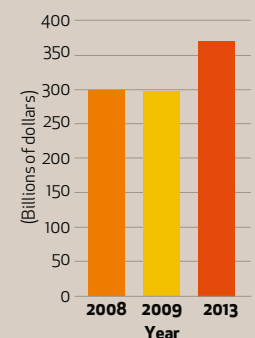
Many phones, one charger

STANDARDIZATION GSMA, the mobile communication industry's association, presented its new universal standard for mobile telephone chargers called Universal Charging Solution (UCS) earlier this year. The idea is that by 2012 all mobile telephones should be able to be charged with the same type of charger. Even the largest international mobile association for mobile operators in the US, CTIA is working towards this goal, writes Metro Teknik.

New investments sluggish

TELECOMS Telecom infrastructure investments around the world are expected to fall by 0.7 percent compared with last year, Light Reading Insider forecasts. The figure will be about USD 296.8 billion compared with USD 299 billion in 2008.

▼ TELECOM INFRASTRUCTURE INVESTMENT



3 HAVE THEIR SAY

What would you like to see more of in Contact?

► **Tiffany Fitzpatrick, Inquiry Agent, USA**



It would be good to read more about Ericsson's new and develop-

ing technologies and what they mean to the consumer (in layman's terms). It would also be interesting to see more about acquisitions and the technologies or capabilities that they bring to Ericsson. And perhaps there could be a section on a different Ericsson office around the world with travel tips for the city where the office is located and the top three things there that can be done while on business travel. Or even include what employees of the featured office like to do in their free time.

► **Sylvie Pitoiset, Network Configuration Engineer, France**



I would be very interested to see more about small market

units' or local companies' activities, ways of working and achievements, in order to reflect Ericsson's multicultural dimension. Every unit, whatever its size, has something valuable to share.

► **Atul Agarwal, Engineer, India**



Contact could include sections specific to market units in which

there are major changes or developments. There could also be a section featuring people that have joined Ericsson from a competitor, sharing their experiences of the competitor's culture.

■ Jenz Nilsson

ONE DAY WITH OUTI KOSKI

"Global Emergency Support, how can we help you?"

Outi Koski is one of the people managing recovery teams for Global Emergency Support in the Global Service Delivery Center in Helsinki, Finland. This is where operators turn when they have serious technical problems. Working as a recovery leader (RL) requires good communication skills and solid understanding of customer needs.

08:30 I reach the office just in time to fetch the recovery leaders' phone before the Global Service Delivery Center opens. The handy RL-o-Matic tool shows me all ongoing emergencies. Since there is only one case open, I go for a coffee with the other team members.

09:00 It's really quiet, so I go through induction activities with a new colleague.

11:00 It's time for lunch with some friends. As an RL you don't want to push your luck by scheduling your lunch late. If you do, you may be called to a case 15 minutes before the cafeteria closes.

12:00 The first case of the day: An American operator has a problem with their OSS-RC, Ericsson's sub-network manager. Most of the processes are down, which means the customer isn't able to collect statistics or monitor its network. We quickly build a recovery team including our OSS-RC experts and start wor-



PHOTO: MICKIE EKLOF

Outi Koski completed her recovery leader training six months ago. The usual period for working as an RL is two years.

king by remotely connecting to the system.

13:30 The system is recovered in an hour. The customer and market unit representatives are grateful for the prompt action and the constant progress updates. I realize these moments are why I enjoy working as an RL.

14:00 I haven't received new calls, so I decide to join a team recovering a Sudanese Mobile Media Gateway while waiting. I have a Mobile Media Gateway background, so I am able to brainstorm actions with the team.

16:00 There is a new emergency. The

problem is located in India, where prepaid mobile phone customers are not able to check their balances or recharge their accounts. We analyze the case and realize we don't have enough knowledge of the problem on our own. After consulting the Senior Recovery Leader, the case is han-

ded over to another Global Service Delivery Center, which is luckily already open.

17:00 A team in Canada is ready to take over the case with our assistance. Another day in the emergency support is concluded.

■ As told to Cia Kilander

This is Outi Koski

- **Title:** Experienced Services Engineer / Recovery Leader
- **Years at Ericsson:** 4
- **Family:** Boyfriend
- **Lives:** Helsinki, Finland

Koski prefers:

- ✓ **City** Countryside
- ✓ **Books** Morning paper
- ✓ **Cinema** DVD
- Evening home
- Individual
- ✓ **Evening out**
- ✓ **Team sport**

PHOTO: ARCHIVE



Success took time

LOOKING BACK "The telephone has outgrown its cradle and now stands on its own feet." That was the marginally amusing advertising slogan that was to be used for the launch of the Erifon, later known as the Ericofon, in the US. But the Second World War halted the plans, and it was not until 1949 that design work got going again. Gösta Thames, an engineer and industrial design expert, designer Ralph Lysell and a team of skilled model-builders who gave the telephone its characteristic appearance – the rounded base, supportive thumb-grip and an upper section that fitted both the hand and the ear. In early 1950, representatives from Bell Laboratories placed an order based on a blue wooden prototype. The first phone was ready just more than three years later. The attempt to register the trademark Erifon failed, partly because the name was not sufficiently different from the Edison-registered Ediphone. So the name was changed to Ericofon. Mass production started in 1956, but the number of orders soon reached five times production capacity. The phone was affectionately known as the Cobra.

☒ Cia Kilander



PHOTO: ISTOCK

Goats better Google's work environment

ENVIRONMENT Employees at Google's headquarters in Mountain View, California can enjoy the silence thanks to 200 goats brought into the area by the company California Grazing to keep the grass in green areas trim, replacing noisy lawnmowers with a considerably more environmentally-friendly alternative. The silence is broken only by a bark from Jen, a Border Collie, who has the responsibility to keep the goats in order.

"We want everyone from telecom company representatives to pirates and politicians. It would be odd not to allow different opinions in this context."

Jan Åman quoted in Göteborgs-Posten after he invited spokespeople for the file-sharing groups The Pirate Bay and Piratbyrån to this year's art biennial in Venice, which he is responsible for.

COMPETE AND WIN A PRIZE

CONTEST How carefully do you read Contact? The answers to the three questions below can be found in this issue of the magazine.

1. How many subscribers does Bharti Airtel have today?
2. What is the name of the tool Ericsson is using to plan the radio parts of its GSM and 3G networks?
3. How many customers will Ericsson visit on the Ericsson Customer Roadshow?

Write your answer after each question, put "competition" in the

subject field and send your answers to contact@ericsson.com no later than August 7. The winner will receive a luxury Ericsson Racing Team beach towel. If more than one person answers all the questions correctly, the name of the winner will be drawn from a hat.

The winner of the last competition was Birgitta Andersson, Sweden.

Answers to last month's quiz:

1. Facebook phone
2. Secure Keys
3. European Telecommunications Standard Institute

What was happening this time...

...25 years ago

1984 Ericsson started its operations in Mexico. The Ericsson Morocco SARL company was formed to assist national operator ONPT with a country-wide numbering plan for fixed telephony.

...10 years ago

1999 The floods in Venezuela in December, in which with 10,000 people died and 300,000 lost their homes, were the biggest natural disaster in Latin American history. Fortunately, no Ericsson employees were seriously injured, but three employees and their families lost their homes. Ericsson Response assembled some MINI-LINK radio equipment to aid telecommunication in the affected area.

...5 years ago

2004 The Ericsson network covered topics this year ranging from women's health to learning about the situation facing female police officers in Sweden. Ericsson, established in the mid-1990s, is a discussion forum for the company's female employees.

Ericsson China greenest again

ENVIRONMENT Ericsson has been named the China Green Benchmark Company for the second year in a row for its innovative and sustainable mobile solutions. The prize was awarded by Daonong Enterprise Institute, Guanghua School of Management of Beijing University, together with China Entrepreneur Magazine and Sina.com.

15%

... of mobile operators' 2008 income came from data traffic and services other than voice, an increase of 24 percent, reports the analyst firm Informa according to Svenska Dagbladet.



“Consumers want to have access to lots of TV channels, even though they will watch only a few of them, Damgard says. “We believe the solution lies in allowing the customer to decide the content themselves.”

Joachim Damgard, Telia Sonera

ALL-IP

The term IP is today well established in most parts of the world. More people are talking about **IP telephony** in the home, at the workplace or in their private lives. As services increase, so does the **demand** from operators and consumers. Ericsson, with its all-IP offering, will be the operators' obvious choice.

"It must be simple"

STOCKHOLM
SWEDEN, EUROPE

The quest to win over Swedish broadband consumers is on. And two companies are advancing together, both with deep-rooted traditions and a clear vision. But in order to beat the competition and position Sweden as a global stronghold for broadband services, there are only two things that matter: to be first and to be best.

Ericsson has been TeliaSonera's main provider for the Swedish rollout of Digital Subscriber Line (DSL) since 2004 and both companies were pioneers during the technical shift from ATM to Ethernet. It was also announced recently that Ericsson will deliver equipment for Telia's mobile-broadband venture based on LTE. Both these IP-based

networks will give Telia a powerful tool to develop future services for voice and TV for example.



Mikael Bäck

"When you buy triple play – broadband, TV and telephony – from Telia for SEK 299 per month, the likelihood is that you will be connected to Ericsson equipment," says Mikael Bäck, product manager responsible for broadband services within Ericsson. "It is natural for us to continue our strong common tradition and our cooperation on the mobile side so that together we can take broadband to the next level with the coming technologies."

Bäck says that Ericsson's Full Service Broadband offering is well placed to ►

ALL-IP



Joacim Damgard near TeliaSonera's Swedish headquarters, in Stockholm's bustling city center.

“TeliaSonera must be able to meet the competition from broadband players such as ComHem, Telenor and Tele2”

Mikael Bäck

Did you know that...

▶ about 50 percent of mobile broadband operators globally have chosen Ericsson as their infrastructure supplier.

▶ AT&T launched the world's first HSPA network in the US in October 2005.

▶ support the new, important services that Ericsson's customers want to be able to promise their consumers. It is these services – such as mobile broadband and IPTV – that place new capacity demands on the network. Today, Ericsson delivers the radio network, Ethernet and IP-based aggregation network, often called mobile backhaul, and the packet-core network to TeliaSonera. These will ensure faster services and fewer delays, and support many more users.

“**TeliaSonera** must be able to meet the competition from broadband players such as ComHem, Telenor and Tele2. Therefore, we must increase the capacity in the network so that we can handle new services such as TV over DSL and mobile broadband when these

gradually reach the same market penetration as mobile telephony and traditional TV.”

How does TeliaSonera see this?

Joacim Damgard, who is responsible for broadband sales at TeliaSonera, is convinced that consumer behavior will change.

“But everything must be simple if we are going to get there, he says. The user must be able to push a button and get what you want.”

Damgard says that TeliaSonera today focuses on both business and consumer sectors. The consumer offering is the most visible, highlighted as it is in the company's advertising. For business, it deals mainly with data communication – telephony and conference solutions. In general, for both dimensions, it is about wider media

consumption. People will simply use a broader spread of media, and the demand from the consumers will increasingly be for interaction.

“**Consumers** want to have access to lots of TV channels, even though they will watch only a few of them,” Damgard says. “We believe the solution lies in allowing the customer to decide the content themselves because we've created the same flexibility and interactivity as, for example, YouTube. Users want to watch what they want when they want. The screen in the living room should quite simply work like a computer.”

Damgard demonstrates TeliaSonera's offering on a flat screen at the company's office in central Stockholm. With a simple press on some

This is mobile broadband

When discussing mobile broadband, it is a good idea to differentiate between the service the customer gets and the technology. When operators market mobile broadband today, they mostly mean internet access using a laptop. This is made possible using a data card, a modem or a built-in module. By far the most common technology for mobile broadband is HSPA: there are currently about 250 active HSPA networks around the world.

remote-control buttons, you can hop between that news program you missed an hour ago, to a documentary on Channel 4 from a couple of days ago, or to your latest DVD film – all the while searching through information about films or upcoming programs in a smaller window in the corner of the screen.

Alternatively you can program in TV-program reminders, listen to the radio and buy films to watch at home.

“Today, we have services including SVT Play, TV4 Anytime, SF Anytime and a Discovery Channel library,” Damgard says. “It is all about non-linear TV instead of the traditional

linear stuff. We think it is important that our customers have that possibility.”

He sums up the concept with the term visual communication – that which the market summarizes simply by “all-IP” or convergence. Consumers will be able to switch between sending text messages, participating in a video conference or watching a TV program – all on the same screen.

Together with Ericsson, TeliaSonera is focusing more and more on consumers living in multi-residence buildings – rental apartments.

“The active equipment is found in the basement, and they are Ericsson boxes,” Damgard says. “We offer TV,

This is fixed-line broadband

With fixed broadband, the user has access to simultaneous voice and internet at speeds of several megabits per second. Development is being driven by strong demand for high-speed internet access, TV, IP-based video mail, chat and gaming, where latency has to be low. Fixed-line telecom operators are pushing to get the most out of their copper networks or optical fiber. Cable-TV companies are offering TV, telephony and broadband over their coaxial networks. Broadband is also delivered over fiber.

broadband and telephony. In the same way, we have started to focus on house owners, even if that is moving more slowly. These consumers of course have to pay for the equipment themselves.”

And, he explains, on the bottom floor of an apartment block, there may be a store that needs payment services, which the operator could also provide. This places demands on the equipment and additionally on the functionality.

But it comes down to the question of who will pay. What will the business model be?

“I believe in several business ▶

“WHAT IS YOUR ORGANIZATION DOING TO ESTABLISH ERICSSON'S BROADBAND SOLUTION IN YOUR REGION?”



Mats H Olsson,
MU Head Greater
China

“Understanding that sales success

for new products and technologies requires a certain amount of incubation, we introduced Strategic Sales Programs for IP, Broadband Networks and IMS at the beginning of 2008, long before the Regional Centers were conceived. With the SSPs we grew Broadband Network sales 25 percent and IP 62 percent during 2008. Now we have a 45 strong Regional Center, fully staffed from within the market unit to ensure the highest quality technical sales support.”



Jaqueline Hey, MU
Head Australia and
New Zealand

We have been successful in supplying

a large number of ISPs with DSL equipment and have been behind first deployments of ADSL2+ and VDSL in Australia. To build our position we took a strong marketing focus, sponsoring research reports, engaging government and customers, targeting media opportunities, helping to establish the APAC Fibre to the Home Council, and ensured we had the internal competence. The mobile broadband business has grown more organically, where we were able to build on strong customer relationships, which has seen widespread take-up of HSPA in Australia.



Jonas Stringberg,
acting MU Head
MU Sub Saharan
Africa

We have established

“Broadband market success” as a Strategic Program to catalyse our go to market forces and speed up the growth of our mobile broadband portfolio. We are aggressively pushing our consulting proposition. 3G Go to Market Program, to provide hands-on support to Operator C-Level in developing a business case, broadband services value propositions and planning the commercial launch. We have also appointed a regulatory Champion whose job is to influence regulators on Spectrum, license and policy issues with the goal to minimize WiMAX's influence.



Cesare Avenia, MU
Head South East
Europe

Broadband is a key focus area in

our Growth Plan. To guarantee high benefits for society, while minimizing costs for customers, our answer is a hybrid approach, that encompasses both fixed and mobile broadband, aiming for all-IP networks.

A key success factor to beat the competition is our broader portfolio. Our transport nodes and gateways allowed us to build for Vodafone in Italy a futureproof and state-of-the-art broadband access network ready for next generation services.

To pave the way for sales in broadband we are concentrating our marketing efforts in a broadband campaign, which integrates global initiatives, like the Broadband Truck Tour, with local ones, like a dedicated Twitter 2.0 space.

“The user must be able to push a button and get what they want” Joachim Damgard

► models, and advertising is one of them,” Damgard says.

TV channels live on advertisements, and TeliaSonera has to have the channels, he says. He advocates improved cooperation between advertisers, telecom companies and operators, in order to develop new income streams for all players.

But then every TV advert should be personalized so that the consumer sees it as informative. It will no longer be enough to target generic groups, to send out mass media messages. But this will mean the industry has to solve the issue of consumer data storage and personal privacy. This will require consumers’ permission and active participation. They use their IP addresses and therefore can be segmented in various ways. You know who is connected, when, and to which websites – what is being bought and when it is being used.

Damgard believes the store-shelf approach no longer works. Only the most popular titles or brands can be found on the shelf, or in a program guide. Those little gems, which only certain individuals want, are on the periphery. There is a need to satisfy people across the range.

On top of this, young people will play a larger role. Personal privacy is no longer as important.

This is where social media come in, and this area is tremendously undervalued, Damgard says.

Collaboration, interactivity and social media fit together. Take Twitter as an example. Imagine if tourists could use it more to help each other – how much more they could get out of their trip. And here too there is enormous potential for advertising – segment-specific, individualized adverts. There is a shift from the mass market to individuals, interaction and cooperation.

Damgard again stresses that everything has to be made simple.

But to digress from advertising for a moment, will the consumer pay? Damgard says the infrastructure is there, everything is digitized and there are legal alternatives to file-sharing in place today.

“I believe that most people agree to the idea of paying, for example, SEK 3 for a song. Today it’s still a bit too expensive. But we are on the right path,” he says.

In addition to a powerful network

and equipment, Damgard says Ericsson can help TeliaSonera with tools for data mining, a term which includes searching for patterns in large amounts of data which can then be used for statistics or target group analysis, for example.

Mikael Bäck adds that Ericsson has a special group working specifically to optimize operators’ business models for broadband.

“**The addition of** mobile broadband has made the offering more attractive than it was when it was purely fixed-line broadband,” Bäck says. “The other important factor is that with mobile broadband there is now a potential for one connection per person instead of one per family, and because Ethernet technology is used so far out, close to the base stations, the cost profile is more like that for fixed broadband. This affects operators’ investment decisions.”

And, adds Damgard: “We have a really long relationship with Ericsson. We have positioned ourselves in the lead, and that means that Ericsson also has to lead. Together we can set the stage for the revenue streams of tomorrow.”

✉ Text: Staffan J Thorsell Photo: Bodil Bergqvist



Jan Färjh

“THERE IS ENORMOUS DEMAND FOR NEW TECHNOLOGY”

Jan Färjh, Head of Ericsson Research, is hard at work developing LTE, the next-generation mobile network. He believes Ericsson is getting closer and closer to realizing its vision of a completely IP-based network with fixed and mobile convergence.

When will we see the first all-IP network?

We first started talking about all-IP 10 years ago, and now we are getting closer. Mobile broadband has been growing solidly, and is developing more quickly than ever. Fixed and mobile networks are merging: there is more

and more IP traffic in mobile networks, and services in the fixed network are becoming mobile. However, there is still a long way to go.

How does the transition to IP affect work at Ericsson Research?

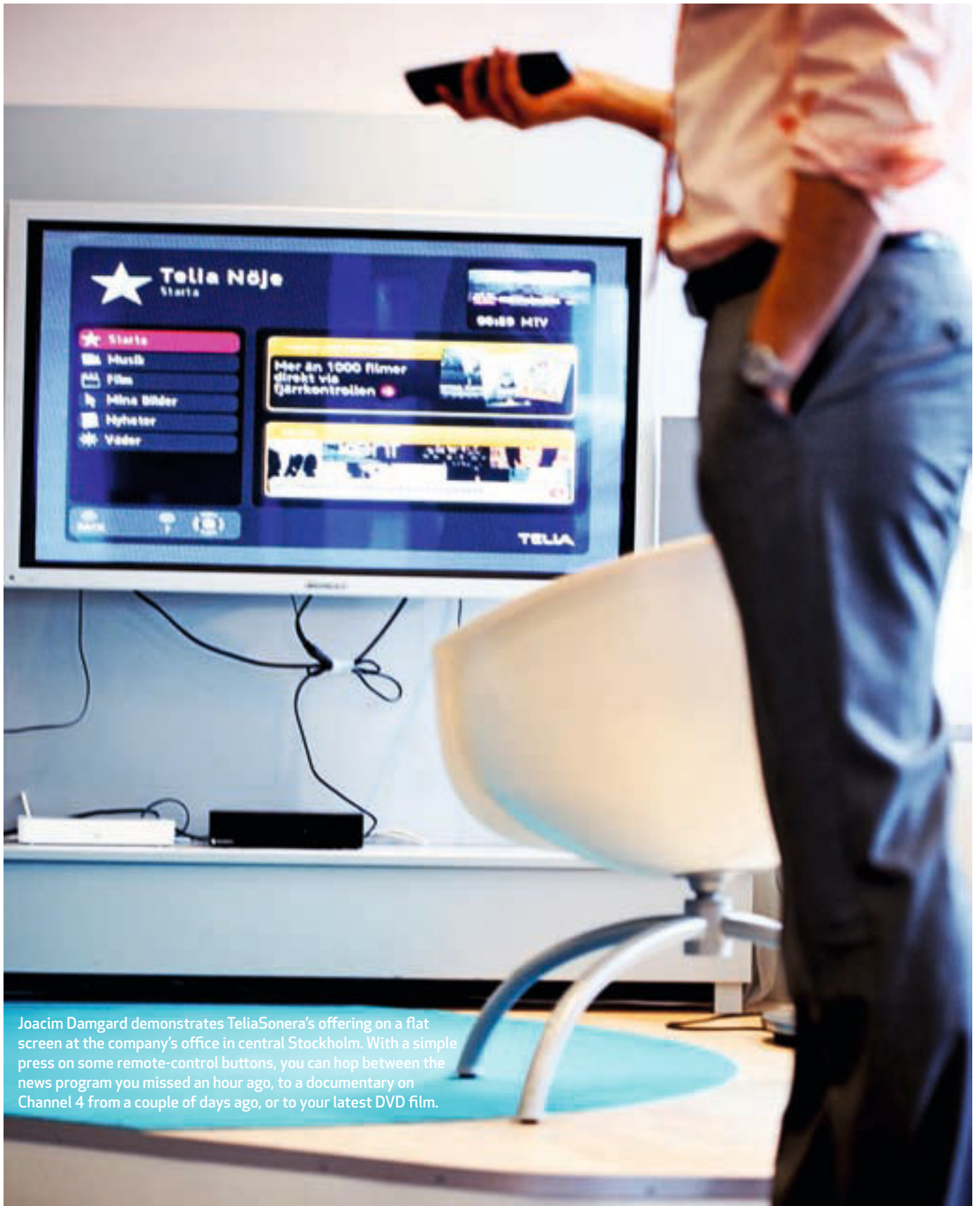
There is enormous demand for new technology, which puts extreme pressure on all of us. And because all-IP affects the entire network, we have to improve in all areas of technology at the same time. For example, we have to improve the functionality and performance in all parts of the network, not only in the radio, but also in the core network, the transport network, within services and applications. We work in short cycles, and we try to get

early feedback on our solutions by having an open environment for new applications.

Does Ericsson have all the competence in-house?

With our acquisitions two years ago, we acquired new competence and ideas and effectively covered the IP gaps. We have also established ourselves by opening a research unit in California, closer to our acquisitions Redback, Entrisphere and TANDBERG. Convergence between fixed and mobile also means we can cross-pollinate and exchange knowledge between areas. It gives us good synergies. We are in the game.

✉ Lars Cederquist



Joacim Damgard demonstrates TeliaSonera's offering on a flat screen at the company's office in central Stockholm. With a simple press on some remote-control buttons, you can hop between the news program you missed an hour ago, to a documentary on Channel 4 from a couple of days ago, or to your latest DVD film.

ALL-IP



Greger Blennerud, who works with business development at Ericsson, says you have to think the right way when calculating profitability for mobile broadband. It is easy to miss the positive effects within other parts of the network, he says.

Mobile broadband is profitable

STOCKHOLM
SWEDEN, EUROPE

Some analysts and operators are starting to doubt that mobile broadband will really be profitable. They are not getting their business models to work. But Greger Blennerud, Sales Development Director at Ericsson, has calculated this together with many leading operators. He sees clear profitability and huge potential.

What worries the industry most is file sharing and other heavy downloads, which are consuming capacity. No matter how much operators expand their networks, 80 percent or more goes to a small group of heavy users. This makes it hard to count on making a profit and to guarantee that other users get the appropriate resources and quality for real-time services.

Reports from Yankee Group and Heavy Reading highlight all the pitfalls, which only makes operators more doubtful. They say, for example, that it is easy to market mobile broadband too much and then be unable to live up to the promises they make.

Some operators have expressed doubts about mobile broadband in the media. However, despite this, expansion is still going at top speed, with a wholehearted focus on mobile broadband, and the chase is on for market share.

“There are operators who say that mobile broadband has already become profitable after just a couple of years, and we see it as the next big thing for mobile networks after voice services,” Blennerud says.

“**The key phrase** is ‘large scale’ – you have lots of subscribers, and you give the users what they want, such as unlimited flat rates. Then with the right tools, you can deal with the heaviest

users so that everyone gets what they need.”

The enthusiastic Blennerud quickly sketches some business examples on his whiteboard. There are columns and curves based both on theoretical calculations and on real, tangible analyses that he and his team performed together with several leading operators.

One theoretical case is for an HSPA base station in the UMTS standard called Node B. (HSPA is an advanced form of 3G that makes mobile broadband possible.) Because a network has many base stations, perhaps tens of thousands, the cost of these is high. An overview of the entire network also shows that the base stations account for the largest single chunk of the overall cost – far more than transmission, switches and control nodes. Yet in a typical case in which a site is used at 50 percent capacity, the cost per subscriber could be as low as EUR 0.09 per month.

The calculation is built on realistic conditions, such as the station being able to handle 7.2Mbps, that it has a certain configuration and costs a certain amount to buy, that it is written off in five years, that it can have a certain number of users at the same time per site, that each user uses 2GB per month, and so on.

“You have to count the right way,” Blennerud says. “There are many pitfalls. Yankee Group is right about that, even if I don’t agree with its interpretation. Common mistakes include not seeing the big picture, that you miss out on positive effects within other parts of the network.” He then shows an image of a total cost and profitability analysis, built on real data. The idea here is that, after four years, the operator will reach 4 percent of the population and have an ARPU of EUR 20 and average traffic per user of ▶

TIPS FOR SALESPEOPLE

- 1. Talk to the customer’s** head of marketing. That is where you find the operator’s driving force
- 2. Make sure the operator** has thought through its marketing strategy so that it is supported by the network – for example, that it has the backhaul capacity required for the service it wants to launch
- 3. Do not be afraid** to test something in an area of the market that has geographic limitations
- 4. Find out more** about the business case for mobile broadband and more about how to handle heavy users and heavy traffic
- 5. Teach customers** about existing opportunities so they can handle heavy users and heavy traffic flexibly

TIPS FOR OPERATORS

- 1. Start as an** everyday bit-pipe provider and make a strategic choice about the speed you will offer
- 2. To move up the value chain,** add services that you can receive payment for and which add value for the consumer, such as mobile TV, 24-hour support, firewalls and antivirus programs
- 3. Add functions** that ensure quality for everyone (Quality of Service, or QoS)
- 4. If you are worried** about margins, start charging – either the consumer in the form of increased monthly fees or traffic charges. Or increase the revenue from the producers, in other words the content owners, for a certain service.

ALL-IP

“For a couple of years, we’ve been assessing business models in detail together with almost 20 operators” Greger Blennerud



Well-founded forecasts and real data show that after a couple of years of normal growth, operators achieve margins that are as good as those from fixed-network broadband or mobile voice.

Did you know that...

...a typical HSPA subscriber uses 0.5-1.0GB per month?
...you can download more than 300GB per month with a connection that gives 1Mbps?
...the typical speed that a consumer gets is 2-4.5Mbps?

► 2GB per month. This shows that after just a couple of years of normal growth, the operator can achieve margins that are as good as those from fixed-network broadband or mobile voice. In short, mobile broadband is fully comparable to fixed-line ADSL.

The strength of Blennerud’s argument is the concrete data behind it. Everything is built on facts received from the operators, leading to forecasts for the next three to four years for traffic and subscriber growth, capacity, traffic patterns, price setting and internal debiting.

“For a couple of years, we’ve been assessing business models in detail together with almost 20 operators and then presented the result to their management groups,” Blennerud says. “We’ve also been working with more of an overview approach with about 30 other operators, who all have – or are upgrading to – HSPA networks. These include well-established and new operators from Western Europe, Africa, Asia and South America.”

The conclusion is clear. Mobile broadband is profitable, even if the operator functions only as a “bit-pipe

provider” – in other words, simply provides internet access. If the operator then moves up the value chain, profitability will of course increase. But even if the calculations and business models look good, the truth is that many operators are worried about heavy downloading, which may continue round the clock. These can include streaming videos, file-sharing and peer-to-peer (P2P), where users send files to each other over protocols that seem to be beyond operators’ control.

Even though everyone seems to believe in the price models being used in fixed broadband, many dare not use these for mobile broadband. They believe that things like heavy P2P usage could wreck the network.

But it is not all doom and gloom. There are some solutions. The equipment can actually identify the BitTorrent protocol that the file sharers use for P2P and limit their usage if it encroaches on other users’ requirements. And it is possible to manage the networks to please everyone.

A regular internet user, for example, needs a relatively high transfer speed, but only for a few seconds. However,

P2P users are not particularly concerned about the speed. They are only interested in downloading things such as films every day, which is more than the average person can consume. If the internet user’s traffic is prioritized and the file sharer gets a lower average speed, it should work.

“The real problem actually comes only during peak traffic, in a few short periods of the day,” Blennerud says.

He sketches a graph of the traffic on a normal day, which shows that P2P usage accounts for about 60 percent of the capacity spread across the whole day, while streaming videos such as YouTube account for heavy but short-duration loads. The combined internet traffic of the two types of users subsequently rises sharply during short, intensive periods, a few seconds each time.

But what happens when a heavy downloader has reached their allocated limit, for example 5GB?

“Some operators are choosing to cut their speeds from 7.2Mbps down to 64kbps,” Blennerud says. “But we believe there are better ways. Why not allow the system to give the user something in between instead, where the downloader gets as much as possible after the others have had their traffic prioritized? The operator can then still have their networks dimensioned for something like 2GB per user.”

Blennerud says the whole profitability issue is partly about what network the operator has and which equipment it has chosen to buy. If it has base stations that cannot mix voice and data across the same carrier wave or radio channel, it loses flexibility and has less opportunity to fend off traffic problems. But if it has Ericsson’s Node B, the situation is totally different.

“I also believe that operators should listen more to their marketing teams and not allow the technology side’s tendency to be overly cautious hold things back,” Blennerud says. “After all, there are ways to solve the problems.”

Text: Lars Cederquist Photo: Per Myrehed

“All-IP paves the way for big service deals”

Increasingly operators are moving towards IP end-to-end solutions for their networks. So how does the new technology affect Ericsson's future services strategy? And how profitable is, for example, a Prime Integrator role for both customers and Ericsson? We put these questions to Josephine Edwall, head of Communications at Business Unit Global Services.

What new demands does all-IP place on Ericsson's service organization?

It places strong demands on our entire offering, both in terms of product-related services such as rollouts, training and customer support, and services such as systems integration, consulting and managed services. All-IP involves great complexity; you need to think in terms of the bigger picture, and have the right mix of technology and people with the right competence. Ericsson has shown foresight by acquiring technology companies such as Redback and TANDBERG. We've built strong IP competence in services through target-oriented recruitment over the past six or seven years. One example of how we've built local competence is Market Unit South East Asia, which has recruited a specialist group with solutions architecture that focuses on IP solutions and supports KAMs within the market unit.

Which new business opportunities do you think all-IP can generate?

All-IP has great business potential for Ericsson. Our customers are experiencing a huge change process, which is leading to increased demand for our consultancy and systems-integration services. The change is to do with technology and how operators will work in the future. We have contracts with many major operators, as their strategic advisors for the choice of technology, business development and, perhaps the most important, helping them make their own organizations more efficient. We also offer network operations within a managed services agreement, and in that way assist operators on the operational side, which gives them more room to focus on

service and market development.

How willing are customers to pay? Is the general opinion that Ericsson is responsible for ensuring that the solutions work?

Today, all operators know that it isn't just about supplying products. Although customers know services aren't automatically included, they value highly them and are prepared to pay for them. Thanks to our global economies of scale, we can also offer more cost-effective solutions.

How can we reduce the risk of competitors coming in and taking over the support of Ericsson products?

The risk is already minimal because we've been developing services since 1876. We have a support organization that is proactive and innovative. We were the first with managed services, where we're now learning from the networks we manage for more than 275 million subscribers. We have an extremely strong service organization that works in 175 countries and which uses common tools, methods and processes. It's hard to copy. Then we have our telecom heritage, which not all our competitors have. Being 100 percent familiar with telecoms is a strength.

How do you think your organization will be working with all-IP in one to five years?

We shouldn't rest on our laurels, even if the future looks bright. We're continually working to improve our competence and our offerings as well as the way we work with our customers. We're focusing on being our customers' Prime Integrator, with full responsibility. In five years we will be the natural first choice for our customers within this area.

Text: Katarina Ahlfort Photo: Per Myrehed



Josephine Edwall,
head of Communications at Business Unit Global Services.



“My job is largely about trying to keep one step ahead of our competitors in countries such as China and India, and finding efficient ways of producing new products.” Marie Nilsson



ERICSSON CABLES & INTERCONNECT

The cable factory

It may sound odd, but without cables there would be no mobile telephony. The growth of mobile telephony has played an important part in the success of the Ericsson factory in **Hudiksvall**, Sweden. Contact visited the unit, which produces **thousands of kilometers** of cable every year.

HUDIKSVALL
SWEDEN, EUROPE

In an area as big as five football fields, machines stand in seemingly endless rows forming a series of production lines in the Ericsson Cables & Interconnect factory in Hudiksvall, 300km north of Stockholm. Despite the huge number of machines, the vast hall is relatively quiet; even though it produces hundreds of kilometers of cable every week, there is an air of calm over the factory.

Marie Nilsson began working here at the start of the 1990s and has had several different jobs in production and management. She is now responsible for developing, testing and verifying new products.

“We have research and development departments in Hudiksvall and in Falun (200km northwest of Stockholm), where we produce power cables mainly for energy companies, and another one in Kista,” she says.

“My job is largely about trying to keep one step ahead of our competitors in countries such as China and India, and finding efficient ways of producing new products. This isn’t always easy, but we have a good production system. Most of our customers are telecom operators, property management companies and those who sell systems for telecommunication.”

There are large rolls of cables in every possible color all over the factory. Three main types of cable are produced here: conventional fiber-optic cable, copper cable and submarine fiber-optic cable. Conventional fiber-optic is used mainly for transport networks for broadband and Fiber-to-the-Home; copper cable mostly for shorter connections in radio base stations; while submarine cables are often laid at sea to connect countries or regions. Each type of cable can be customized for a specific purpose. ▶

“We usually say that mobile telephony is our salvation”

Marie Nilsson



The fibers are bundled, hardened and then colored so the different types can be easily identified.

► Constructing the different cables is a complicated process that requires great precision – but it looks incredibly simple when the big machines are doing their job.

The cables are constructed in steps along the production lines. One machine is producing a submarine cable: the core, consisting of 48 optical fibers, is fed into a tube of stainless steel, which is then protected by a rubber casing. This is covered with a layer of steel wires and then a casing of special yarn. This cable, called Fiber in Metallic Tube (FIMT), can cope with depths of up to 2km.

Today the large submarine cable reel just outside the factory is empty; a major shipment of cable was dispatched to Nigeria from the small harbor a few hundred meters away. Just over a year ago, one of the biggest single orders – for 1600km of submarine cable – was sent to Angola.

From the submarine-cable part of the factory, Nilsson takes us to the

clean room, where the optical fiber is processed. It is important that the room is free of dirt and dust that could damage the fiber. Anyone entering has to wear special protective clothing. Nilsson points out the machines that bundle, strengthen and color the fibers so that each can be identified in the bundles.

The fiber can then be used for submarine cables, or for one of Cables & Interconnect’s patented air-blown fiber – or micro-cable – concepts, Ribbonet and Micronet. With air-blown fiber, as the name implies, the fiber is blown into small plastic tubes, or ducts, using air pressure and a fiber-installation tool. It works for lengths of up to 1km. The ducts can be buried underground, hung on posts or mounted indoors. The factory has also developed combination cables consisting of both high-tension cable and fiber-optic cable. These have become popular within the burgeoning market for wind power, being used to transport electricity, transmit data and control wind-power plants. The combination cables are produced at the Falun factory.

The other half of the Hudiksvall factory makes copper cable. Although fiber continues to gain ground, much of the production consists of variants of copper cable. Most is used in Ericsson’s radio base stations.

“We usually say that mobile telephony is our salvation, because even if it sounds like a paradox, many of our cables are used in mobile systems,” Nilsson says. “This includes different

types of copper cable for radio base stations but also more and more fiber. For example, our latest product, Fiber-to-the-Antenna, is used in radio base station antennas. We have a lot of demand for that right now.”

Kjell Jonsson is standing at a machine, feeding out just such a cable. It consists of two small optical cables molded into a black rubber casing. He looks pleased.

“As machine operators, we’ve been involved in coming up with ways of working and handling this product,” he says. “It feels good. It’s important for me to be involved from the beginning of the process. That makes the job more fun and results in a process that works all the way.”

One person who knows the importance of being competitive is Peter Lo Curzio, product manager for fiber access.

“We began developing our air-blown fiber system in 1995 and started selling in it 1999,” he says. “We were early and we were unique then. But many have copied the system since then, for better or worse. On the one hand, there is now strong acceptance of the concept, but it also means that the competition has become much tougher.

“Ten years ago, many in the industry said that Fiber-to-the-Home would be too expensive to be a success. Now, hardly anyone would say that. During those 10 years, the prices have gone down by more than 80 percent, thanks to more effective processes and new technology for end equipment. Ten years ago, people did not see the need for 100Mbps. Today, many new services require those speeds and we’re now planning for speeds of up to 1Gbps. That is obviously a scenario that benefits those of us who work with fiber.”

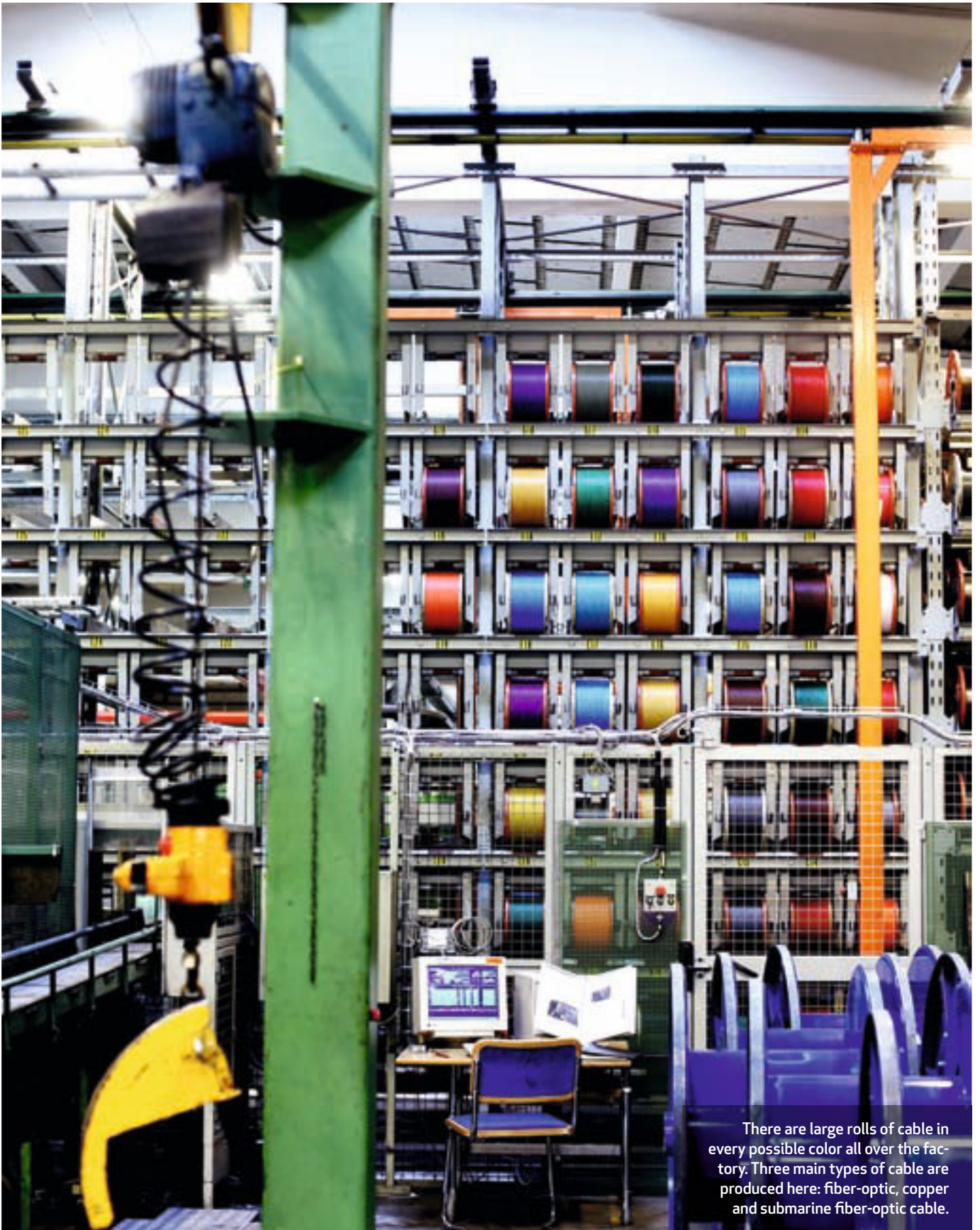
The gloomy financial situation around the world has led to a reduction in orders booked for Hudiksvall’s products. To prepare for tougher times, the factory has been forced to reduce staff numbers by 100. Most have been offered early retirement, and many chose to resign with a year’s paid

MORE THAN 11 MILLION EU HOUSEHOLDS HAVE FIBER-TO-THE-HOME

THE EXPANSION OF Fiber-to-the-Home in Europe has increased rapidly in recent years. Fiber is now accessible by more than 11 million households, and of them, 1.7 million are connected according to Idate’s latest report, produced on behalf of the ETTT Council Europe.

The will to invest in Europe remains strong, and during the last half of 2008 the share of

buildings and houses with fiber broadband connections increased by 27 percent. During the same period the share of subscribers rose 25 percent. The majority of subscribers with fiber access are in Sweden, Italy, France, Norway, the Netherlands and Denmark, which together account for 79 percent of the market.



There are large rolls of cable in every possible color all over the factory. Three main types of cable are produced here: fiber-optic, copper and submarine fiber-optic cable.

»» **New services are driving the sale of cable** »»

“In a small town like Hudiksvall, the staff turnover is low and many have been working here for a long time” Tomas Flodin

Did you know...

... that a single optical fiber, as thin as a hair, can transmit 3.2 terabits per second, equivalent to more than 50 million ordinary modem connections or more than 5 million ADSL lines. A fiber cable can contain up to 100 fibers. Even with today's technology, it provides effectively limitless capacity.



Along the production lines the cables are built step by step.

► notice. Following the staff cuts, there are now 350 employees.

One of those to have seen both upturns and downturns in order flows is Tomas Flodin, head of sales. In November last year, he and 180 others celebrated their 30th anniversaries as Ericsson employees, at Stockholm City Hall.

“In a small town like Hudiksvall, the staff turnover is low and many have been working here for a long time,” he says. “So such decisions are obviously hard to take. But I’m hopeful about our

future and fully believe in Fiber-to-the-Home. The customers with whom we’ve been doing business are pleased with our solutions and products. But if we’re to continue to have a strong position, it’s important to deliver what we promise, with the quality that our customers are demanding.”

Flodin is responsible for a major project in Qatar, which ended in May. The country, which is only 160km long and 70km wide, is one of the richest in the world thanks to major gas and oil deposits. Ericsson has been building up infrastructure for broadband over

fiber there for two years. Later this year, there will be a decision about who will supply the equipment for phase two of the project. Flodin is, of course, optimistic about Ericsson’s chances.

“The project has been going very well and historically our reputation in the Middle East is very good,” he says.

In many countries in Scandinavia and the rest of Europe, numerous operators and property companies have invested in Micronet and Ribbonet. Demand for fiber is increasing in Africa, China and India, including Cables & Interconnect’s solutions for Fiber-to-the-Home. Cables & Interconnect is also involved in several pilot projects for Fiber-to-the-Home elsewhere around the world.

Scandinavia, the rest of Europe, and Asia use fiber often for longer distances. But fiber is often missing in the final link to the home. The people in Hudiksvall are placing a lot of hope in Fiber-to-the-Home, Flodin says.

“IPTV, faster internet speeds and new video services are driving the need for greater broadband capacity. And so you have to go for fiber. There is no alternative,” Flodin says.

☒ Text: Hendrik Bergstén Photo: Bodil Bergqvist

ERICSSON CABLE & INTERCONNECT:

- **Previously** an independent part of the company, the factory is now part of Business Unit Networks.
- **It sells, develops** and manufactures cables and accessories for telecommunications and power networks, with a focus on fiber-optic infrastructure and integration of copper-based, fiber-optic and wireless technology.
- **Its customers** are telecoms operators, property management companies, owners of public and private networks, utilities and providers of telecommunication systems.
- **It has factories** in Hudiksvall and Falun, and offices in Kista, as well as joint ventures in India, Malaysia, China and the UK.
- **The factory** in Hudiksvall produces fiber-optic cable, copper cable and submarine fiber-optic cable.
- **The factory** in Falun produces power cables for land and sea connections.
- **Cables & Interconnect** has a total of 700 employees.
- **The Hudiksvall factory** employs 350 people, 70 of them white-collar workers. Most of the staff have at least three years of high-school education and many of them are engineers.

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ERICSSON 

TAKING YOU FORWARD

"It is nothing but math"

As an 18-year-old, Sunil Mittal borrowed USD 1500 from his father to start a bicycle crankshaft factory. He then moved into yarn, brass, power generators and push-button phones, to name just a few areas. Today he leads an **Indian telecom giant** that he built essentially from nothing. Bharti Airtel boasts almost 100 million mobile subscribers in India.

When Mittal is asked about how he built the third-largest national operator in the world, he returns again and again to one thing: his company's "pathbreaking models of outsourcing." And to which company has Bharti Airtel outsourced most of its network infrastructure? Ericsson.

Telecom is all about scale, says Mittal – in the order of tens of millions of customers.

This is especially true in India, which has the lowest tariffs in the world, around one US cent per minute. And in an ultra-competitive market, Mittal already has all the size he needs, with a 25 percent customer market share and 30 percent of market revenue.

"It is how you survive," Mittal says. "It is nothing but math."

The Indian wireless market is growing by millions of new customers each month – the 15.6 million new subscribers in March brought the country's subscriber base to 391.8 million. Yet even in a country of 1.15 billion people, some larger cities are already nearing saturation, and Mittal predicts that several of India's newer operators will fail, unable to reach the scale they need for survival.

To maintain its top spot, Bharti Airtel is

moving forward on two domestic telecom fronts, developing value-added services such as music and ringtones for urban areas while making a major push into rural India, opening 20,000 rural service centers in recent months.

But Mittal is also on the hunt for scale outside India. Last year he tried to negotiate a "merger of equals" with African operator MTN, but the USD 50 billion deal fell through.

"This would have been an emerging-market telecom giant," he says a little wistfully. (At time of publication, Mittal had reopened merger talks with MTN.)

Mittal dismisses the rampant speculation about his next move – except to say that he is "open to opportunities."

Mittal has said he would look first at emerging markets for any future acquisition bid, though he also sounds intrigued by Europe, where people talk much less but pay much more than in India.

"Can someone grow their minutes in Europe while lowering the tariff at the same time?" he asks. "I don't know. This is something that needs to be looked at."

Sunil Mittal is the fourth-richest man in India, with his family worth about USD 7.7 billion, according to Forbes magazine. Yet he walks alone, and quickly, through the halls of Bharti Enterprises'

relatively modest corporate headquarters in New Delhi. He is friendly but focused, smiling easily but answering quickly, with an air of finality to each on-message response.

Mittal is a self-made billionaire, and the legend of his humble beginnings in the bicycle crankshaft factory is etched into the ►



Sunil Mittal
CHRIS MALUSZANSKI

SUNIL MITTAL/ BHARTI AIRTEL

► **Name:** Sunil Bharti Mittal

► **Title:** Chairman and Group CEO, Bharti Enterprises.

► **Headquarters:** New Delhi

► **Age:** 51

► **Family:** Wife and three children

► **Education:** Punjab University, Harvard Business School

► **Through the Bharti Foundation,** Mittal has made it a priority to bring quality education to poor children, especially girls, in rural India. There are now 158 Satya Bharti Schools with nearly 18,000 students across several Indian states.





“Early 3G was poor and expensive. We missed all that. Now the technology has evolved” Sunil Mittal

► algorithms of internet search engines. But it was not until 1992 when, already the dominant manufacturer of landline telephones in India, he got his truly big break, winning a government license for the Delhi wireless “circle.”

Mittal managed success – in other words, he survived – in a mobile market that had ruined numerous competitors. But the move he credits with putting him at the forefront of the Indian wireless world came in 2004, when he signed a USD 400 million agreement to outsource much of his GSM network infrastructure to Ericsson. Outsourcing has since become widespread in telecom, but, five years ago, it was turning conventional wisdom on its head for an Indian company to let a European one run its network.

“It was about efficiency,” Mittal says. “Who knows the network best? The manufacturer. Why not have them run it for us?”

Outsourcing allowed Bharti Airtel to “scale up very quickly,” Mittal says, and focus on distribution, branding, innovation in services and collection.

“We were at 6 million (subscribers), trying to get to 25 million,” he says. “We would have had to hire tens of thousands of new employees (if not for the outsourcing).”

Mittal emphasizes that he chose outsourcing for practical, not financial, reasons and that all of the company’s networks remain “on the books.”

But he would not mind if someday they were not.

“Our ultimate goal is to get to the state where we just buy minutes off the network; a network which could serve two or three companies,” he says. “But that is still some time away.”

As for what he looks for in an outsourcing partner now, Mittal says: “We want great uptime and a high-quality network. In earlier years, the support in rollout was very important. That is less of an issue now.”

Within Indian telecom, Mittal says that 3G will be

the game changer, but not in the ways most people outside India might think.

First, India provides relatively little spectrum for mobile services, he says, so 3G will add capacity for voice services.

Plus, while 3G in the US and Europe is centered on urban areas, bringing new speed and services primarily for existing customers, Mittal believes that in India, 3G will make the most impact in rural villages, where the country’s crushing poverty is still at its worst.

“Many of these villages have never seen a fixed line, or any form of connectivity,” he says. “They have only been connected through wireless. They need broadband. Imagine putting a handheld computer in every village. It is a powerful thought.”

But 3G remains on hold for most of India. While state-owned operators Bharat Sanchar Nigam Ltd, (BSNL) and Mahanagar Telephone Nigam Ltd, (MTNL) have started offering 3G, the auction for private licenses has been repeatedly delayed and is now on hold.

But Mittal says Bharti Airtel may have benefited from not being among the first operators to introduce 3G, both in India and around the world.

“Early 3G was poor and expensive,” he says. “We missed all that. Now the technology has evolved.”

Mittal made his fortune in telecom and clearly remains heavily committed to expanding his business in India and abroad. But as India’s mobile market stabilizes, he is also preparing for life after telecom. Mittal is transforming Bharti Enterprises, Bharti Airtel’s parent company, into a diverse conglomerate with new businesses – and foreign partnerships – in agriculture, retail and financial services.

“In India (in the mobile sector) we are seeing growth now of 20 to 25 percent, not 100 percent,” he says. “And we do not want to end up as a 10-percent-growth company.”

✉ Text: Nathan Hegedus Illustration: Ebba Berggren

BHARTI AIRTEL

► **2008 revenue:** USD 7.4 billion, up 37 percent year-on-year

► **Subscriber base at the end of 2002:** 2.8 million

► **Subscriber base at the end of March 2009:** 93.9 million

► **Subscriber-base growth from 2008 to 2009:** 50 percent

► **Company voted India’s most innovative** in a Wall Street Journal survey last year

Australia, 1962



Ericsson CEO **Sven T. Åberg** gets things moving at Broadmeadows, then farmland but now a suburb of Melbourne, Australia. Ericsson was to build a new factory there after Australian subsidiary LM Ericsson Pty Ltd signed a contract with the Australian Postmaster-General's Department, which ran the country's telecom services. Operations would include cable-winding, fine-tuning, assembly, cabling and testing. The first stage of construction, covering 12,000 square meters, started in November 1962, with the first 350 Ericsson employees moving in on December 6, 1963.

Photo: **Archive**

Point to Point Communication

Instructions: Read the subject category and question. Start with the five-point question and continue to the right until you have an answer. When you have gone through all six categories and guessed a year for the picture below, calculate your total score and compare it with the maximum tally, which is 35.

Subject/Points	5 points	4 points	3 points	2 points	1 point
History What year?	The world's most expensive mobile phone, the GoldVish "Le Million," was sold for EUR 1 million.	This year marked the 250th anniversary of the birth of composer Wolfgang Amadeus Mozart.	The mobile phone celebrated its 50th anniversary and the two-billionth GSM user was connected.	Google bought YouTube for USD 1.65 billion.	The Winter Olympics took place in Turin, Italy and the FIFA World Cup in Germany.
Geography What country?	Ericsson opened its office here on November 29, 2004.	An anonymous buyer paid US 2.75 million at an auction here for the mobile number, 666-6666.	It hosts the prestigious season-ending ladies' tennis tournament, the Sony Ericsson Championships.	Saudi Arabia, Bahrain and the United Arab Emirates are neighbors of this Middle-Eastern country.	This oil-rich nation's capital city is called Doha.
Culture Name the movie?	The tagline was: He is afraid. He is totally alone. He is 3 million light years from home.	It was a multi-Oscar winning science fiction film directed by Steven Spielberg.	Released in 1982, this blockbuster was the most financially successful film released at that point.	It features an alien who attempts to build a device to "phone home."	The loveable alien is aided in its plight by a young boy called Elliott.
Natural history What creature?	This gave engineers a fright when found stuck in an RBS circuit board in Brazil in 2003.	There are more than 2,700 species spread across every continent except Antarctica.	The Ericofon was nicknamed after a particularly venomous member of this species.	In the Bible, one tempts Adam and Eve to taste forbidden fruit from the Tree of Knowledge.	With a long, narrow body, covered in scales, this reptile sheds its skin every year.
Technology What network technology?	NEC and Ericsson were the major network equipment manufacturers.	At its peak this cellular standard had more than 80 million subscribers.	Based on TDMA technology, it operates in the 800MHz and 1500MHz bands.	The first system was introduced by NTT DoCoMo in 1991.	This second-generation technology was developed and used exclusively in Japan.
Business What company?	Operating 10 3G networks around the world, it has more than 19 million subscribers.	It introduced "no charge roaming" across the majority of its networks in February, 2007.	This operator was the first to launch 3G in the UK, Australia and Italy.	Hutchison Whampoa is the majority shareholder.	Instead of a brand name, this telecom operator is famous for its number.

Which year?
 5 points for the right year
 4 points for the year +/- 1 year
 3 points for the year +/- 2 years
 2 points for the year +/- 3 years
 1 point for the year +/- 5 years

TURN THE PAGE FOR THE RIGHT ANSWER

History: 2006; Geography: Qatar; Culture: ET: the Extra-Terrestrial; Natural history: Snake; Technology: Personal Digital Cellular (PDC); Business: 3; Which year: Mexico, February 1913; Ericsson staff defend a telephone station during the civil war.

