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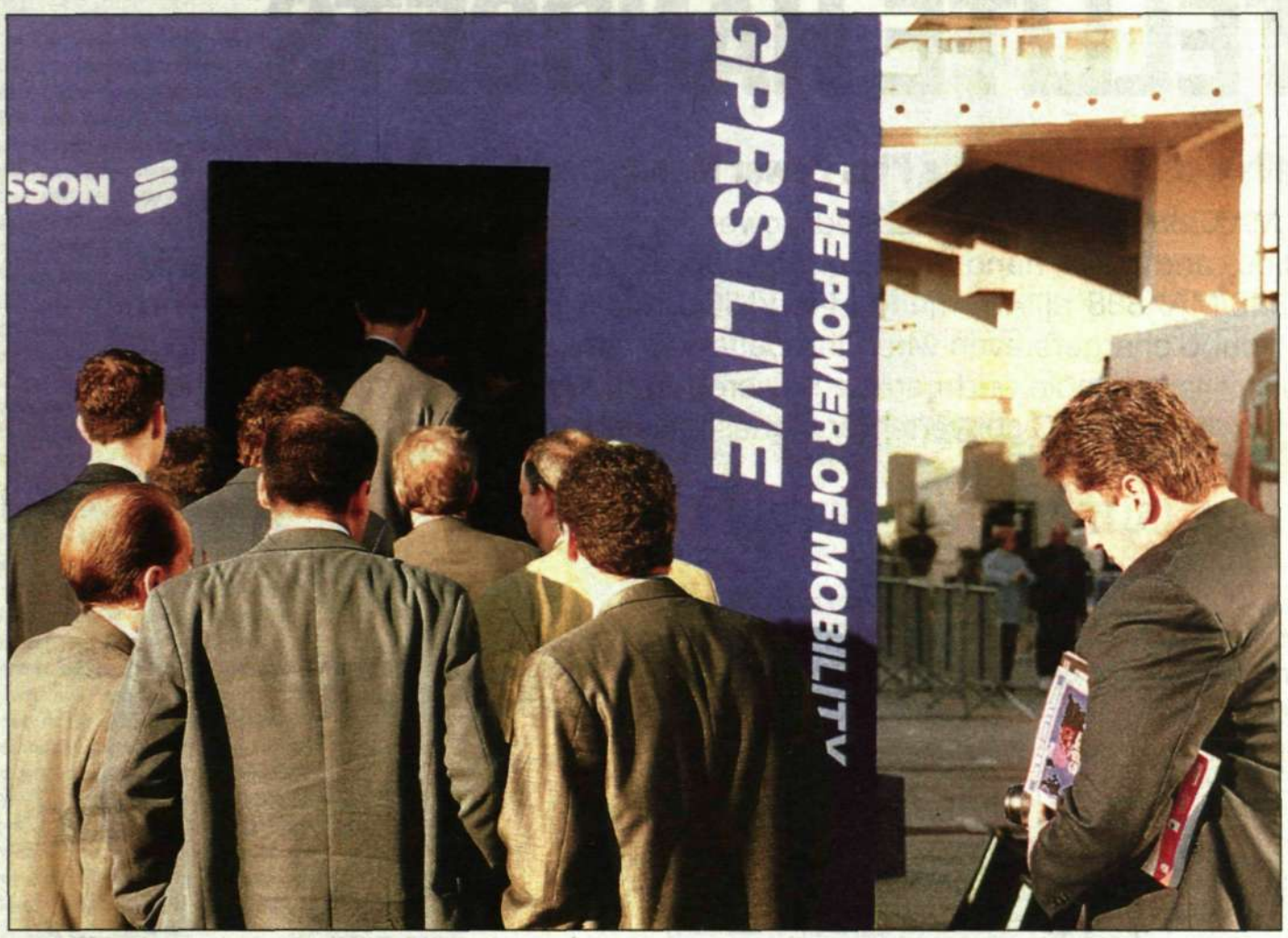


Ericsson demonstrated WAP over GPRS from a container at the GSM World Congress in Cannes, on February 2–4. This was the first time that it had been demonstrated in its entirety, that is all the way out to a GPRS telephone. A prototype was used in Cannes. Interest was so great that visitors had to sign up for demonstration times. Photo: Lars Åström

Crowds queue for demo of mobile packet data

The first few days of February saw the hotshots and the wannabees of the GSM world assemble at the GSM World Congress in Cannes, France. This is where deals are made and new contacts established. Ericsson demonstrated several new products, including a new IP router and new base stations. **6**

Turkish operator Turkcell has ordered an expansion of its GSM network.

Mobile Systems sign record order in Turkey

The largest order ever for Ericsson's Mobile Systems was signed last week with Turkish mobile phone operator, Turkcell. The expansion of its GSM network is valued at SEK 7.2 billion.

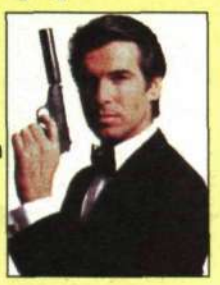
Turkcell has rapidly expanded its network and currently has a capacity of 7.7 million users. As recently as 1999, Turkcell completed another major expansion of its network, making Turkey Ericsson's seventh largest market in 1999. **5**

NEWS

Wäreby plans to increase sales

Jan Wäreby has been named the new head of Consumer Products. His first goal is to increase sales by raising volume. **4**

Norwegians book movies by phone



The Norwegian operator Telenor Mobil, together with Ericsson, is currently testing a service to book and pay for movie tickets via mobile phones. It is one of several mobile Internet projects. You can read more about it, along with how the Internet can provide consumer protection, IP security and more in the IT/IP supplement. **Supplement**

More room for new ideas

New ideas are key elements to Ericsson's success. At Business Innovation, business ideas that do not fit within the rest of the organization are tested and evaluated. Mobile e-box is one example. **12–14**

High-rise WAP solutions

Soon, your WAP phone could be clever enough to recognise your taste in music. This is one of the applications being developed at Ericsson's Cyberlab in Melbourne. **15**

Family business in Zimbabwe

For nearly forty years, Ericsson's standing in Zimbabwe has been represented by a single family business. **11**

FOCUS ON MUSIC

Ericsson was one of the sponsors of the Swedish Grammis award. **17**

COMIC STRIP

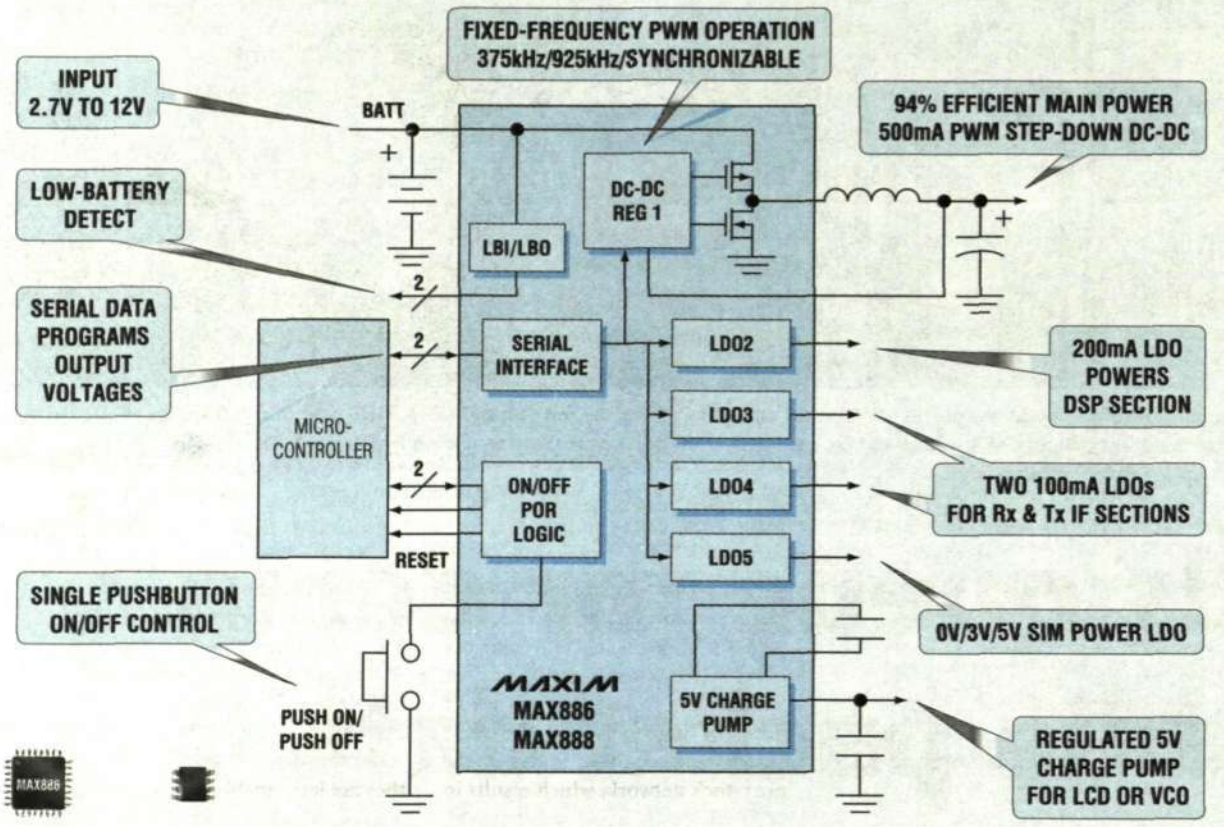
What does Dad really do at work? Eric & Son have the answer. **17**

COMPLETE POWER MANAGEMENT FOR SATELLITE HANDSETS

Six Digitally Controlled Outputs Plus Power Management in a Single IC

The MAX886* and MAX888 are highly integrated power-supply systems for satellite phones, private mobile radios, and other hand-held portable applications. The wide input voltage range of the MAX886/MAX888 allows many Li-Ion/NiCd/NiMH battery configurations and accommodates wall-cube chargers even when the battery is removed. For flexibility, the input to each linear regulator is available and can be powered from the battery to get the highest total power or from the main DC-DC converter for highest efficiency.

SIX-OUTPUT POWER SUPPLY SAVES SPACE



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Wireline systems is in the game again

"In just twelve months, we have made a fantastic come-back," says Einar Lindquist, head of Ericsson Wireline Systems business unit. "In a very short time, we have overtaken our competitors and are now reporting excellent sales."

"We had an incredibly good year in 1999," reports Einar Lindquist, head of the Wireline Systems business area. "Wireline Systems is now profitable and can look to the future with optimism." Photo: Lars Åström

Wireline Systems, the business unit for fixed networks, has undergone a metamorphosis in a short time. This has not been accomplished without sharp cut-backs and re-organization, but the result is a dynamic unit that now has a strong market position.

Today, there are slightly more than 15,000 employees around the world, which is 6,000 less than a few years ago.

"We live in a market that is changing extremely rapidly," says Einar Lindquist. "The old monopolies are gone and in Europe alone, about three new operators pop up each day. In the fastest case, it takes ten minutes for anyone who is interested to get a license to operate a network. We have to keep pace and decide which operators we want to work with. There is a risk of choosing the wrong one, but luckily, many of our local companies are very good at picking the right ones."

Exceeded expectations

Wireline Systems reported strong results in 1999 for both order booking, sales and profits.

"The results exceeded our expectations," admits Einar Lindquist. "But we have quite simply succeeded in adapting to new market conditions and getting one step ahead. More than 25 percent of our order bookings are for products and systems that did not exist one year ago.

"Our role with respect to new and existing operators has also changed," continues Einar Lindquist. "Traditionally, Ericsson never works as a network operator, but we are getting closer and closer as we become more deeply involved with operators. We must move up the value chain. We cannot remain in our traditional role. That much is clear. But we will never 'own' the customer or hold an operator's license."

Ericsson Wireline Systems is prevailing in the battle for Europe, with Nortel as the most powerful adversary, while Siemens and Alcatel are defending their home markets in Germany and France. But Cisco and Lucent are also targeting Europe, very much aware that they must adapt to the market and cannot do as they do at home in the US.

"We represent the new way of thinking," says Einar Lindquist. "We have strong products, and customers listen to us. The best evidence is our Engine concept, which is our solution for integrating ATM and IP technology in the customer's network, no matter what was there previously."

At this point, Einar Lindquist cannot resist boasting about Ericsson's AXD301 ATM switch, which he believes is without rival in the market. He also emphasizes that the whole point of Engine is that the ATM switch replaces other nodes in the operator's network, which results in reduced costs and lower investments. This is also a market that is growing rapidly, since everyone needs powerful backbone and access networks.

Experts in telephony

Ericsson's lead, however, is not just a question of good products and solutions. To a great extent, it is the result of 120 years' of experience within the company.

"We understand telephony. It's in our blood, and we've made it a fine art," explains Einar Lindquist. "Many new players will undoubtedly be able to sell products and systems, but when it comes to the proof, when they need to provide support, they are less capable. And customers always stumble somewhere, and then you have to be able to solve their problems."

Supporting customers

Ericsson is developing its role to include the capability of supporting customers in their business operations and of always offering new technology, without sitting and waiting for something to happen.

Einar Lindquist has reason to be proud. Wireless Systems has reversed the negative trend.

"We have had an incredibly good year, and everyone is working in the same direction," he notes. "But it must not be a one-time event. We have to continue to change faster than the market. It's up to us if we are to succeed in the future as well.

A major challenge for 2000 is the US, a market where Wireline Systems has been weak and where Lucent has the advantage.

"We are reviewing our US strategy, and we also hope to see an upturn in Asia, which has not yet recovered from the economic crisis," concludes Einar Lindquist.

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DID YOU KNOW THAT...

the 10 largest customers account for 22 percent of Ericsson's total sales.

IN BRIEF

Hong Kong summit draws over 300

➤ Ericsson president Kurt Hellström is calling the company's top executives to a two-day conference in Hong Kong in mid-February.

On the agenda will be discussions of strategy, overall message and how Ericsson should work to maintain the pace of change and stay competitive.

The meeting is intended to ensure that executive managers are all working toward the same goal.

Similar meetings will be held annually as part of ongoing operations.

The participants represent the entire Company and will be responsible for conveying the messages and information produced during the two days to all employees.

Contact will be on the scene to report on the meeting.

Buy shares via WAP phone

➤ Postbank, one of the Netherlands' leading banks, has signed a contract with Ericsson Business Consulting and Dutch operator Libertel for wireless banking services.

First out will be an application that will enable Postbank's most active investors to buy and sell shares using their cellphones.

A six-month pilot project will connect investors directly with the Amsterdam stock exchange using Ericsson's R 320 WAP phone.

Later, bank customers will also be able to make payments over the wireless network.

Ericsson has also signed an agreement with Internet-based mutual fund company HQ.SE (an arm of the Hagströmer & Qviberg Group).

The two companies plan to jointly develop solutions for wireless trading.

If the results are favorable, WAP-phone users will soon be able to buy and sell shares and access financial news and analyses via their phones.

"Our strategy is to be the leader in wireless Internet business solutions, which is why we view HQ.SE as a natural partner," explains Thomas Thard, business advisor at Ericsson Business Consulting.

New GSM order in China

➤ Ericsson is slated to expand the GSM networks of the Chinese province of Jiangsu.

This contract, worth SEK 580 million, is from operator Jiangsu Mobile Communications Corporation (JMCC).

"In the very near future, we will offer customers GPRS-based services such as WAP services."

"Right now, we are continuing a partnership that has worked very well during the past four years," says He Ning, the head of JMCC.

The estimated capacity of the GSM network after the expansion is 2.35 million subscribers.

JMCC is not a new customer for Ericsson, having won its first Jiangsu contract as early as 1995.

Wäreby set to pump up mobile phone volumes

To pump up the volumes and make the Consumer segment more profitable is the tremendous responsibility that Jan Wäreby is shouldering. He has taken up the new position as head of the beleaguered Consumer Products business segment.

During the fourth quarter last year, Consumer Products demonstrated clearly favorable performance, sales increasing by 33 percent. However, the profit margin for the full year remained at the unsatisfactory level of 1 percent, and Ericsson has lost market shares during the past year.

"Kurt Hellström has given me the job of increasing our profit margin for the year to at least 10 percent and recapturing our 15-percent market share. And we'll do it," says Jan Wäreby, interviewed by Contact on his way to Raleigh, North Carolina to meet his new colleagues.

How do you plan on doing that?

"We already have an excellent product portfolio that is up and running. As executive Vice President of the EMEA market area, I know how well our new phones were received, but we are simply unable to deliver sufficient volumes. My most important task when I start the new job next week will be to increase our capacity to deliver and to pump up the volumes," says Jan Wäreby.

You have been involved with mobile systems at Ericsson for 15 years and recently served as market-area executive Vice President – but what do you know about consumer products?

"Mobile phone sales actually have two foundations. One is marketing messages to consumers and the Ericsson brand. Here, Consumer Products already has considerable expertise, and the Ericsson brand name is very strong today. The other foundation is our relations with operator customers."

"As market-area executive Vice President, I was in close contact with the operators, particularly regarding mobile phones. I know virtually all of our big customers in Europe, the US and Latin America. That's a big advantage.

Why are you moving the Consumer Products head office to London?

"Our heavy nodes are in Lund, Sweden, and RTP in the US, and we have units in Singapore, the UK, the Netherlands, Germany, Spain, Japan and Stockholm. All of these destinations are easy to reach from London. Besides, moving the business segment closer to the markets sends an important signal. Europe currently accounts for half of Ericsson's cellphone sales," says Jan Wäreby.

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Jan Wäreby will assume responsibility for Consumer Products in mid-February. Photo: Peter Nordahl

Ragnar Bäck to steer new market area

GPRS and UMTS will be this year's major challenges, according to Ragnar Bäck, who as of mid-February will take over responsibility for the new Western Europe market area.

The market area Europe, Africa and Middle East is divided into two areas: one for western Europe and one for eastern Europe, Africa and the Middle East.

As of February 15 Ragnar Bäck will be in charge of the first of the new areas and will therefore be a member of the corporate executive team.

The head of the second area will be announced shortly. In February Ragnar Bäck will vacate his post as President of Ericsson in Italy.

The new appointment will involve more traveling and require that he move to the Ericsson office in London, but he never hesitated before accepting it.

Ragnar Bäck

"I've enjoyed working as company head for Ericsson in Italy, but I feel this new job will also be a lot of fun. Basically, it's exciting to do something completely different," he explains.

All member states

The Western Europe market area includes all EU member states plus Norway and Switzerland.

Ragnar Bäck has been the Vice President and general manager of Ericsson in Europe, in Australia and in New Zealand. With 30 years of experience in the company, he knows which areas must be given priority this year and in the future.

"Undoubtedly, the focus this year will be on third-generation mobile systems. We will market 3G technology and UMTS and work to obtain contracts in this area.

Intensified cooperation

"We will also become even better at delivering total solutions, increase both the range and the content of our services, and work even more closely with customers. Intensifying cooperation between Ericsson companies in Europe will enable us to work more efficiently and reduce costs."

Massimo Gentili, currently in charge of Public Operators at Ericsson in Italy, will be the new head of the Italian company.

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Bluetooth for CDMA

➤ Last week, Ericsson Microelectronics and Qualcomm CDMA Technologies presented a partnership to develop Bluetooth solutions for the CDMA standard. The solutions may prove to be the first of their type.

"Developing a variety of exciting applications for the end-user has been and will continue to be the driving force behind our work," explains Johan Lodenius, one of those responsible for markets and products at Qualcomm CDMA Technologies.

PBX sets record

➤ In December 1999, 188,624 lines for the Ericsson's MD110 PBX were delivered, an all-time-high and a marked increase compared with the previous delivery record from August 1999, 164,640 lines.

For the full year, the figure is 1,515,975 – 7.8 percent more than in 1998. If license production in China and Brazil are included, the total number is 1,652,927 MD110 lines delivered in 1999.

New base station handles growth

Ericsson presented two new GSM base stations yesterday, the RBS 2206 and the GSM Capacity Booster, at the GSM exhibition in Cannes.

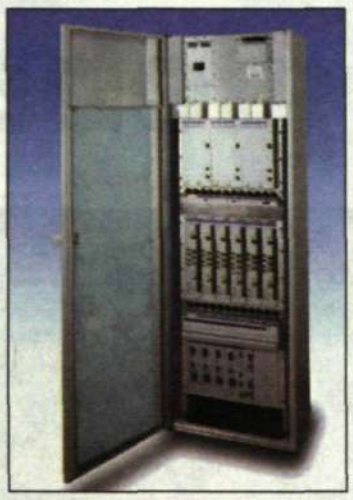
The number of subscribers in the world's GSM networks is growing explosively. One of the biggest problems for operators is boosting capacity without adding new sites, while currently preparing for WCDMA. The new base stations were developed to meet these needs.

RBS 2202, which is an indoor macro base station, is a huge success for Ericsson and undoubtedly the world's best-selling base station. Now the RBS 2206 is being launched as its successor with 100 percent greater capacity. The new base station is the practical result of close collaboration with major customers who have been deeply involved in development work. Despite the doubling of capacity, the new RBS 2206 occupies the same floor space as the RBS 2202.

First of this type

"The new base station can be seen as a bridge to the future in that it can handle both conventional GSM services and 3G services over both Edge and WCDMA," says Per Wilén, product manager at Ericsson's GSM Systems business unit.

The second new base station, the GSM Capacity Booster, is based on completely new technology employing active antennas. Ericsson is first in the GSM world with a commercial product of this type. The GSM Capacity Booster consists of an indoor RBS 2205 base station and an adaptive antenna.



The new RBS 2206 radio base station doubles capacity without taking more floor space.

"Whereas a conventional antenna sends an entire sector at once, the adaptive antenna divides the radio cell into eight lobes in which power can be focused. It always selects the lobe that is best oriented for handling the call," explains Karin Craig, who is a product supervisor at GSM Systems. "This means that interference is significantly reduced, thus allowing the operator to increase capacity."

Excellent performance

The GSM Capacity Booster is therefore best suited to heavily populated areas where operators often have difficulty in increasing capacity without simultaneously sacrificing quality or being forced to build new sites.

The new base station has been shown to deliver excellent performance in field tests with Germany's largest operator Mannesmann.

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Microelectronics in new form

➤ On February 1, the Ericsson Microelectronics business unit formed a new company in Sweden under the name of Ericsson Microelectronics AB. This company will serve as a parent company for global microelectronics operations involving about 2,000 employees. It now also includes the Power Modules business unit formerly belonging to Ericsson Energy Systems.

Operations are conducted primarily in Kista, Kalmar and the Stockholm suburb of Kungens Kurva, as well as in the US, China and the UK.

Microelectronics was previously part of Ericsson Components AB, which will now cease to exist.

Sigrun Hjelmqvist has been appointed as President of the newly formed company. Energy Systems will now conducted operations in a newly formed company, Ericsson Energy Systems AB, pending the take over by Emerson Electric.

Sigrun Hjelmqvist, President of the new Ericsson Microelectronics AB, christened the company in the marine manner by smashing a bottle of champagne. Photo: Peter Nordahl

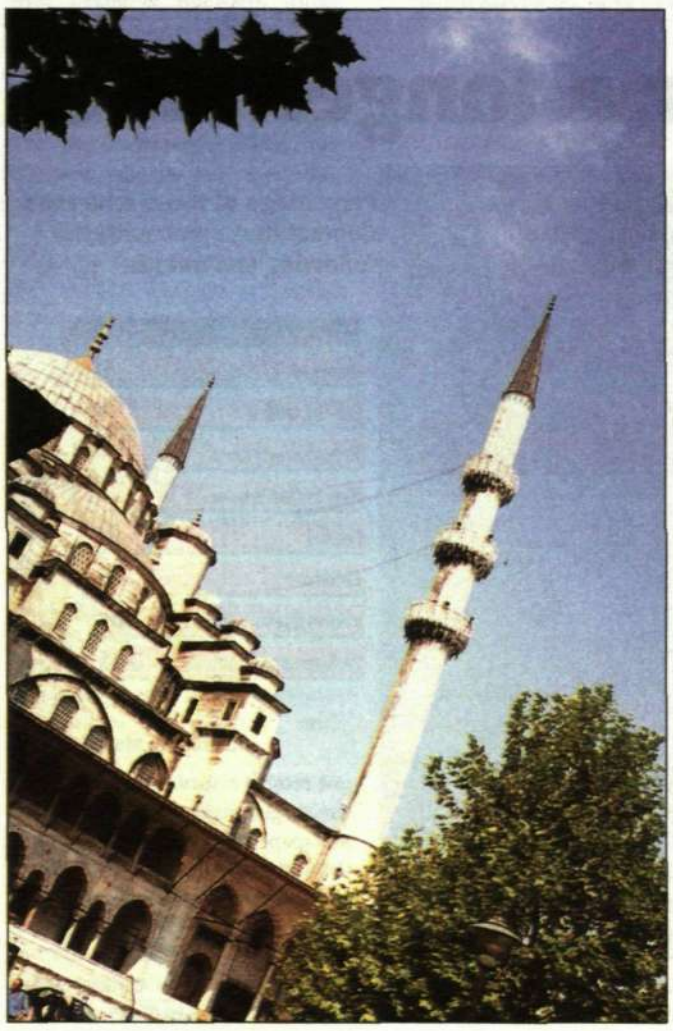
Intel to supply flash memory

➤ Ericsson has signed an agreement with microprocessor manufacturer Intel for the purchase of flash memory chips for mobile phones. The contract guarantees Ericsson sufficient volumes of memory chips.

At the same time, the two companies will work jointly to develop the next generation of flash memory chips, which will be able to store web pages, e-mail, voice and music.

The contract, which is important for Ericsson's ability to develop products for third-generation mobile systems, is valued at over SEK 1 billion.

Intel, the world's largest chip maker, also manufacturers computer, networking and communications products.



Record-breaking order doubles Turkish network

Ericsson unveiled its largest GSM contract to date at the GSM trade show in Cannes.

The contract, with Turkish operator Turkcell, is worth USD 850 million – SEK 7.2 billion and covers the expansion of the Turkcell mobile telephone network.

The expansion involves both capacity and coverage in the larger cities and along the Mediterranean and the coasts of the Black Sea.

The equipment required for the expansion will be delivered by September or October this year.

Turkey is developing as a key player for Ericsson in Europe: last year Turkey generated the largest sales increase of all Ericsson markets recording a figure of 117 percent.

The boundaries of Turkcell's operations do not stop at the Turkish border; Turkcell operates GSM networks in Georgia, Kazakhstan, Azerbaijan and Cyprus. And the launch of a system in April this year will see Moldova included too.

Sören Ahlstedt

"The Turkish government will issue several new licenses for the 1800 MHz band, probably be in April. There are several groups that are interested in the licenses," says Sören Ahlstedt.

The record order from Turkey is the largest GSM order to date.
Photo: Gunilla Tamm

Gunilla Tamm

HELLO THERE

Maud Hansen

...who was recently appointed as environmental specialist at the Ericsson plant in Gävle, Sweden. In early January, she was given the title of Senior Specialist in the area of environmental applications within electronics production.

Congratulations on your appointment! How does it feel?
"Fantastic! I've been deeply concerned about environmental issues since I was in my twenties, but before working for Ericsson I haven't had the chance to be involved in the area."

Why have you received this appointment?
"Ever since the Gävle plant was environmentally certified, we have achieved our annual targets – for example, we sort large amounts of waste and have also substantially reduced emissions of solvents to air.

"The Gävle plant was one of the first plants in the Company to attain environmental certification. The fact that we succeeded in reaching our goals is a result of the efforts of all employees, even though I was among the driving forces."

What are the main environmental issues for the Company right now?
"Reduced environmental impact from transport, energy consumption and hazardous substances."

What do you like best about your job?
"I have, and have had, the benefit of getting to know many people in Ericsson who are involved with the same issues, and it is inspiring to meet so much enthusiasm and involvement. I've encountered surprisingly little resistance in my daily work – most employees are enormously supportive of environmental activities."

What distinguishes a specialist from an expert?
"There are three levels: senior specialist, expert and senior expert. To put it briefly, to advance to a higher level you have to acquire further knowledge and acknowledgement, both within and outside the Company."

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Ericsson Services quickly establishes global presence

A lot has happened at Ericsson Services in the seven months the new business unit has been in existence. A worldwide organization with four regional offices has been established, business grew by over 50 percent last year and a new policy for service and guarantees has been developed.

Bert Nordberg is head of the Ericsson Services business unit, formed just seven months ago. The new unit, which is becoming more familiar within the company, has a big challenge to ensure that Ericsson gets paid for services. Photo: Lars Åström

Ericsson Services was created in response to the increasing importance placed on services, now that the emphasis is shifting from products to solutions. At the same time, telecom and datacom technologies are merging, making the service sector an interesting and profitable area. Bert Nordberg, head of Ericsson Services with approximately 15,000 employees, is enthusiastic when he talks about his work creating the business unit, which is a part of the Network Operators business segment.

"Creating Ericsson Services has been a stimulating, groundbreaking project involving major change. It now feels as though the organization is moving in the right direction. It's also a plus that we managed to generate an increase in sales with the same number of employees. I think the fact that service is now included in the company policy blue book is confirmation that our operations are important," says Bert Nordberg. At the same time, he hopes to avoid any reorganization this year.

"However, major changes are needed when it comes to expertise. We need to become more experienced with third-party products, especially within ATM and IP, and there is an urgency in acquiring that knowledge. Since it is difficult to find highly skilled employees within these fields, we will be hiring people where the customers are.

"Even though much of our work has to do with the future, it will also continue to be important to provide service for old products, since those are the products we're generating income from today," he emphasizes.

An ATM and IP certification program for 150 people has been started. In general, all employees need to increase their datacom skills, which is why the Knowledge Step training concept has been adopted, and is being exported to employees around the world.

Payment for services

Bert Nordberg also commented on customer training. The unit formerly known as Ericsson Training has changed names and is now called Ericsson Education.

"For Ericsson, it pays to invest in customer training," he says. "The more that customers learn about our products, the less support they need, and once they're familiar with the products, they come back and buy more."

Another important area is service and making sure to charge for it. According to Bert Nordberg, Ericsson has given away services far to long, even to very large customers. When he cites other data companies as examples, he knows what he is talking about since he worked as a service manager in the IT industry prior to coming to Ericsson five years ago.

"We need to educate our customers about the value of services," he says. "A policy covering service contracts and guarantees has recently been developed."

Thanks to the work that was done prior to the millennium shift, the company now has a complete overview of where all its customers are located, worldwide.

Ericsson's market units play an important role since they are the company's eyes and ears among its customers. Huge changes are occurring – solutions of the future will by built into systems out among the operators, which is why market units need to establish service centers close to customers.

Important this year

Bert Nordberg cites four important areas of operation this year. The first involves Ericsson Services' share of the company's invoicing, with a goal of just over 16 percent. The second has to do with "uptime" and pertains to the amount of time customer systems operate without interruption. Going from today's 99.994 percent to 99.996 percent may seem like a small step, but in reality it is a rather long time.

Yet another important task this year is to fulfill the goals that are found in TTC Global, Time to Customer. The fourth task is to get all customers to sign written contracts with Ericsson Services.

It is important that Ericsson's customers view the company as a single entity, as is now the case with services from the Network Operators business segment. Bert Nordberg believes that within a few years, local companies will have specialized units for service of all Ericsson products and solutions, truly forming a single entity in the eyes of customers.

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More people read Contact for a longer time

An important source of information, easy to read and provides a good overview. The content is not always so well organized, however, and the writers' expertise is in question.

These are some of the comments that Swedish Contact readers made in a recent Temo readership survey. For the third time, Contact editors hired Temo to conduct a readership survey of the company newspaper, in order to find out what can be improved and how many people read it.Results of the Swedish readers' opinions are presented here. An international readership survey is currently being conducted.

Contact is read somewhat more, both in terms of the number of pages and amount of time, compared with the two previous surveys conducted in 1995 and 1998.

Of those surveyed, 47 percent read more than half the contents of the paper, compared with 44 percent in 1998. The newspaper is read for ten minutes or more by 80 percent, compared with 64 percent in 1995.

The percentage of readers who read the paper for 30 minutes or more jumped from 8 percent in 1998 to 22 percent. Easy to read, provides a good overview, informative, current, factual, easy to understand and credible were some of the positive comments that readers gave. Negative feedback included poorly organized content and not especially knowledgeable writers. Many Ericsson employees were unfamiliar with the relatively new web-based news channel, Infocenter, which has been operating since August 1999, www.ericsson.se/infocenter. Only two percent visit the website daily. More people from outside the company use Infocenter to keep themselves updated about what is going on within the Ericsson world. Altogether, the site attracts 30,000 hits a day, including both Ericsson employees and people outside the company. The readership survey was sent to 604 people, of which 54 percent responded.

Were you one of those who did not receive a survey but would still like to give your opinion about the newspaper? Send e-mail with positive and/or negative comments to: contact@lme.ericsson.se

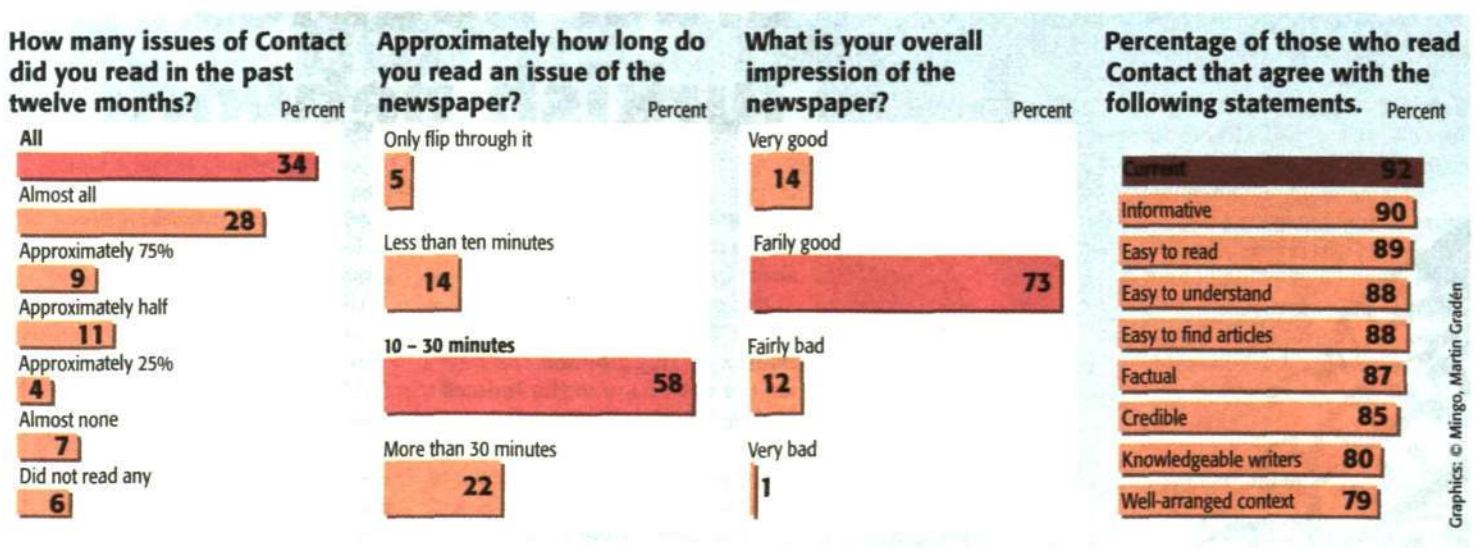

Illustration: Martin Gradén

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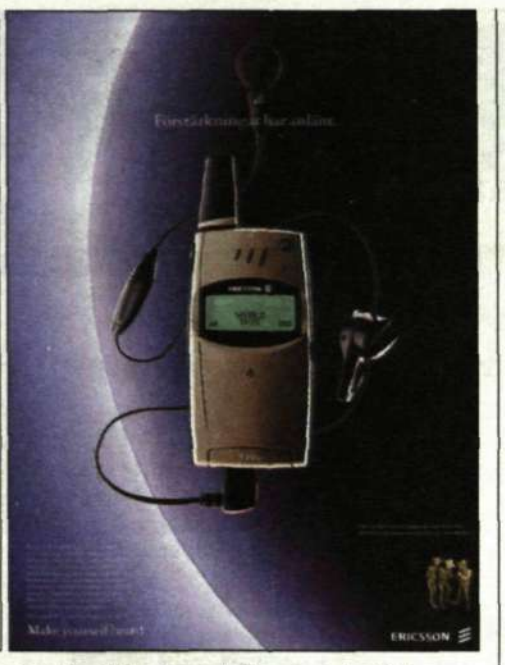


Portuguese pocket, the Swedish flag, and aliens. Today Ericsson communicates different messages in advertising from different parts of the company. Each individual campaign or advertisement may have its merits, but if Ericsson's corporate messages are not uniform, they can do more harm than good.

Ericsson strives for more uniform messages

Clear and uniform marketing messages are an important part of strengthening the trademark. Ericsson has signed framework agreements with three selected advertising and media companies for effective global coordination of the company's messages.

In the creative process, including how an ad should look and the message that it conveys, Publicis is the new partner for the business segments Network Operators and Enterprise Solutions.

The Consumer Products business segment will continue its previously established partnership with Young & Rubicam, whose business arm MediaEdge was selected for all of Ericsson's media purchases. CIA Medianetwork has been selected to establish Ericsson's first joint media strategy. This work is now in progress and expected to be completed in February.

All of the agencies selected are represented virtually throughout the world. Christer Wikander, Agneta Bonde and Lars Svanström – from the corporate function for Marketing Communications – developed the new contracts, which took effect on January 1.

Clarity missing

"Our goal is to become more accurate in targeting our messages and to get more value for the resources invested. Each marketing activity that conveys an unclear message does more damage than good," says Lars Svanström, who is responsible for relations with Publicis.

Everything must be consistent: the message, how it is presented and in what forum.

An Ericsson ad should always be easy to recognize, and the various messages should complement, not contradict, each other.

Business units based primarily in Sweden have thus far had contact with nearly 50 different agencies. Marketing units have established their own local relations, often without coordination.

Better unit coordination

Now Publicis' London office will become the coordinating party for the business units, while the marketing units will work directly with Publicis' local representative.

"The various units have seldom coordinated their activities in advance in media purchasing," observes Agneta Bonde, who is responsible for planning and coordinating the company's media purchases, which will now be made entirely through MediaEdge.

"In that MediaEdge as of January 1 will negotiate for all of Ericsson, much greater discounts will be possible, so this coordination in itself will result in a significant increase in efficiency," continues Agneta Bonde, who points out that the media are dependent on advertising revenues and often seek out various Ericsson units to sell advertising space.

All such contact should in future be forwarded directly to Media Edge (Susanna Idman, tel: +44-171-611 6725).

Important work

Increasing understanding and enthusiasm among all those affected by this change is now a priority.

At a conference in December, in Saltsjöbaden outside Stockholm, the strategy was presented to market communicators from all business units plus the 16 leading marketing units. Many opportunities were given for the exchange of ideas and discussion.

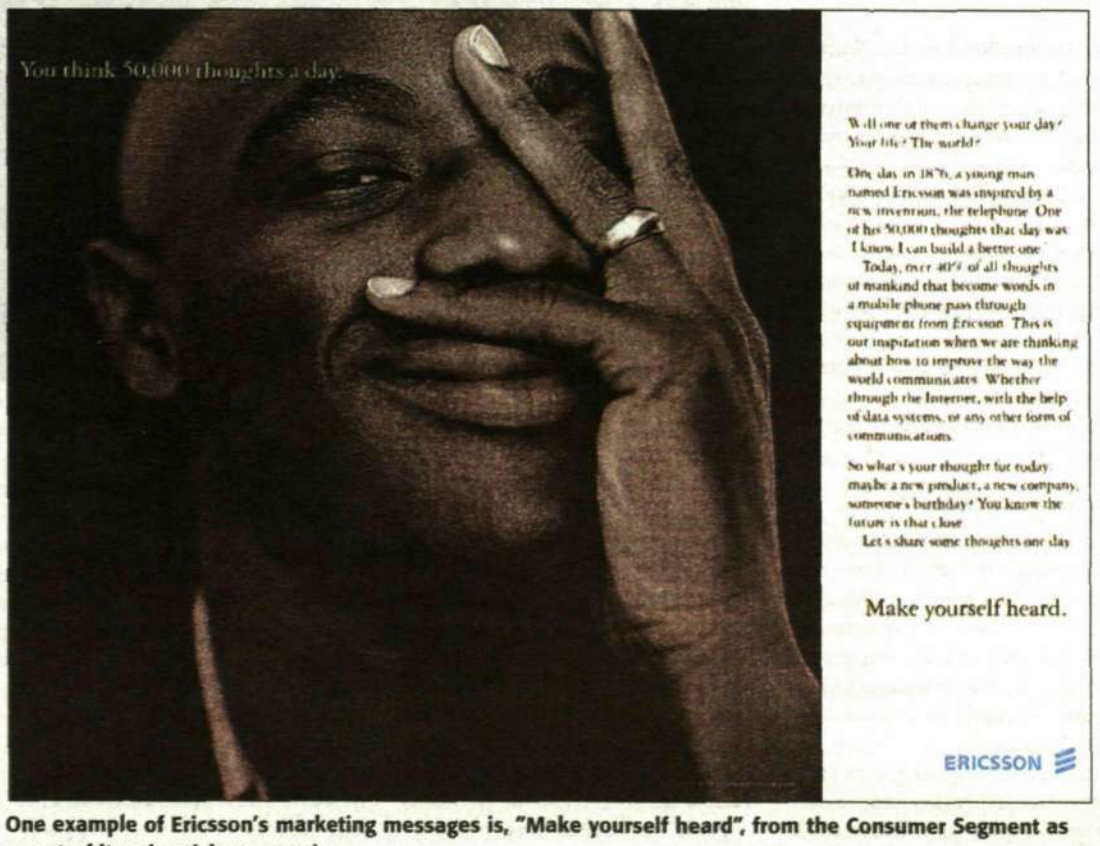
"Everyone viewed the change positively and saw the benefits of working with a few agencies that know Ericsson well," relates Agneta Bonde.

Torbjörn Nilsson, Ericsson's executive vice president for Marketing, emphasizes the importance of taking a comprehensive approach to external communications.

"Ericsson's market is not only undergoing a shift in technology, but also a shift in business logic. This convergence must be reflected in our marketing communications.

"By focusing on a small number of partners we are creating the prerequisites for harmonizing our activities, strengthening the Ericsson trademark and using our resources more effectively," concludes Torbjörn Nilsson.

Kari Malmström, freelance journalist



One example of Ericsson's marketing messages is, "Make yourself heard", from the Consumer Segment as a part of its advertising campaign.

Success for Let's WAP

The Let's WAP campaign has now been concluded. Ericsson Business Consulting is following up more than 2,700 registered visitors and some 50 attractive customer prospects.

Anders Nyquist, Marketing and Strategies manager at the Ericsson Business Consulting business unit is pleased with the campaign.

"We achieved our objectives with the campaign, which was to increase interest in Ericsson Business Consulting and to profile ourselves as a consulting company of rank. We have unique expertise in business and communication solutions for the mobile Internet" says Anders Nyquist.

With Let's WAP as the theme, the campaign's emphasis was on the Internet, and the campaign's web site was the principal medium. Visitors were drawn to the site by banners placed on 125 selected Internet sites with ties to business media and through printed advertisement in business magazines. The campaign ran from October to December last year and was concentrated to seven European countries and three market segments: banking and finance, transport and travel and media and entertainment.

"WAP was chosen as the theme, since business solutions for WAP and mobility are one of the strongest driving forces among our customers," says Anders Nyquist. "It was also in line with our strategy of profiling ourselves as the leading consulting company in migrating to a mobile Internet."

The campaign site contained information on both WAP and Ericsson Business Consulting. In building the site, considerable attention was devoted to attracting visitors and building up a customer database. The interactive portion was an important component that allowed visitors to order or download sales brochures, WAP documentation and a specially composed CD with relaxing music, book a meeting with business consultants or reserve one of Ericsson's WAP phones.

"Thanks to 'Let's WAP,' our customers and other stakeholders have now begun to perceive Ericsson, which they already recognize as a supplier of innovative technologies, as a global consulting company that offers companies advanced business solutions," says Elisabeth Jörgensen, who is responsible for marketing measures and brand profiling at Ericsson Business Consulting.

The Let's WAP site attracted 49,000 visitors who clicked through to the site via banners.

"We achieved fantastic results in a short time," relates Elisabeth Jörgensen. "After an initial evaluation, we can see that 2,700 visitors registered on the site. Of these, we consider 60 percent to be very interesting prospects. Of the total number of visitors, we expect more than 50 to result in a business relation."

By offering the market 400 WAP consultants in conjunction with the launch of the campaign, interest in Ericsson Business Consulting and WAP was increased.

During the more than two months that the campaign was in progress, Ericsson Business Consulting signed several important contracts for WAP and mobile Internet solutions.

Tanja Lundqvist, freelance journalist

www.ericsson.com/letswap

www.ericsson.com/businessconsulting

GSM-seminars in Cannes transmitted via Internet

Those who couldn't attend the GSM conference had the option of virtual participation via television transmissions over the Internet.

In addition to customer seminars and Ericsson press conferences, short news segments were also transmitted daily.

"This was the first time that the GSM Systems business unit utilized television transmissions in this manner. The most important aspect has been the ability to provide our customers with fresh, up-to-the-minute information from the conference," explains Hans Oskar, who is responsible for marketing information at GSM Systems.

Seminars archived

Customers who did not have the opportunity of traveling to Cannes were still able to follow customer seminars via the Internet, using passwords they had received in advance.

All of the presentations, including seminars with speakers, were filmed and are now stored in an archive available to customers.

Linking Internet to events

"We want to demonstrate that we practice what we preach by linking the Internet to various events, such as conferences and trade shows where Ericsson is a participant," explains Hans Oskar.

"Our goal is to improve the flow of information between ourselves and the world around us utilizing the latest technology."

Mobile users everywhere

The GSM trade show really had an impact on the atmosphere in Cannes during the first few days of February.

Men dressed in suits with mobile phones and palmtop computers could be seen strolling along the Croisette, the main road along the shoreline, as well as sitting in chairs on the beach.

The GSM World Congress is not only an important conference and trade show, it is also an important place to meet with customers and colleagues, in order to network.

Gunilla Tamm

14TH GSM WORLD CONGRESS

The fourteenth annual GSM World Congress was held in Cannes, France, this year.

It attracted a total of 14,000 visitors, a 56-percent increase compared with last year. Over one hundred nations were represented by some 5,500 delegates, an increase of 34 percent from 1999.

Of the delegates, 24 percent were from Western Europe, 21 percent from Eastern Europe and 20 percent from the Far East.

A total of 276 exhibitors from 25 countries were on hand, a 33 percent increase over last year.

The GSM World Congress is not simply a conference and trade show, but also a place where customers, suppliers and colleagues meet and network. Many important conversations took place under the sun along the beach in Cannes. Photo: Lars Åström

Cannes – focal point of the GSM world

Everyone who has anything to do with GSM was in Cannes, France, last week at the GSM World Congress.

Ericsson unveiled several new products, including a new base station and an IP router, as well as providing a GPRS demonstration using a prototype phone.

For those who couldn't be present in Cannes, it was possible to follow events via television transmissions over the Internet. Here, Mats Dahlin, head of Network Operators, explains about Ericsson's record GSM equipment order from Turkey.

Mats Dahlin, head of the Network Operators business segment, spoke warmly about the mobile Internet during Ericsson's press conference in Cannes.

"It's not simply a technological revolution, it's just as much a social revolution," he said.

Mobile Internet is dramatically changing the way people communicate with each other. In only five years, the number of mobile Internet users is expected to be more than double the number of fixed Internet users today.

Two new contracts

Mats Dahlin announced several news items including two new contracts. One is for a GPRS 1900 system for Pacific Bell Wireless in California and Nevada, and the second is a record order from GSM operator Turkcell, to expand their network.

Although GPRS packet data technology (General Packet Radio Services) was the center of attention at the GSM World Congress, Ericsson was the only operator able to conduct a demonstration of GPRS all the way out to a telephone.

A prototype of Ericsson's GPRS phone was used in Cannes. A WAP over GPRS demonstration was conducted from a container outside of the congress hall.

Visitors could choose between several different applications, the most popular being Microsoft Chat, which uses figures sporting varying expressions and caption bubbles for personalized text.

Petra Lundmark, head of GPRS marketing, noted that there was a great deal of interest in the GPRS service at Cannes and that visitors, even VIP groups, had to book demonstration times.

Real-time IP traffic router

Among the new products that Ericsson was showing off in its display were the RXI 820 and IP-BSS, real-time routers, which both attracted a great deal of interest.

IP-BSS is the first important step towards an entirely IT-based mobile network. The system will allow GSM and TDMA operators to upgrade their mobile phone systems in order to better handle the large amounts of data that are expected in future mobile networks.

The transport capacity of wireless access networks can be managed 40 percent more efficiently using IP-BSS.

The RXI 820 router is the biggest of its kind in the world. It is an important part of Ericsson's total solution for services based on real time in wireless networks.

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Record year for Nokia

Nokia once again exceeded all expectations. Chairman and CEO Jorma Ollila foresees continued strong growth this year, but some weakening over time. Photo: Pressens Bild

The telecom giants are on a roll. Last Friday, Ericsson presented its best-ever quarterly report. Nokia followed on Tuesday with a report for the best-ever quarter, the best-ever year and a record dividend.

Nokia's chairman and CEO was clearly pleased as he presented the 1999 figures.

"The company is in excellent shape. We have succeeded in achieving the goals we set in 1997," said Jorma Ollila.

Nokia today is one of the world's most profitable companies. During 1999, the company's profits increased 57 percent to SEK 33 billion. But how long can these almost incredible results be maintained?

"Our growth this year will be 30 to 40 percent, and over the long term, we retain our forecast for 25 to 30 percent growth," said Ollila.

Two percent gain

Despite the company's record profits, the Nokia share increased by only two percent on the reporting date and closed at SEK 1,606. This can be compared with the Ericsson share, which on the reporting date increased 6 percent to SEK 664.

Last year, the Finnish telecom giant launched 18 new mobile phones. According to the company's estimates, 275 million phones were sold in the world, compared with 168 million in 1998. Nokia's share of the world market was 28.5 percent, reports Swedish business daily Dagens Industri.

Research and development

In order to maintain growth, Nokia is continuing to invest heavily in research and development. A large portion of last year's budget, SEK 15 billion, was invested in Nokia's 52 research and development centers.

These centers employ nearly one third of the company's employees. In conjunction with the annual general meeting, the company's board of directors proposed a split which will divide each share into four. According to Swedish business daily Finanstidningen, a decision on the split will be taken in March.

Nokia's management wishes to reward the company's 55,000 employees who made the record earnings possible.

This reward will be in the form of a bonus, calculated at 5 percent of annual salary. The company's owners also have reason to be pleased with a proposed dividend per share of SEK 6.89, corresponding to a total of SEK 8 billion.

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Mannesmann and Vodafone to merge

Vodafone and Mannesmann, two of Ericsson's largest customers are merging. The new company will be the world's largest mobile telephone operator with 42 million subscribers.

The merger is the largest-ever merger in Europe and the second largest in the world after America Online's purchase of Time Warner last month, reports Swedish daily Dagens Nyheter.

Mannesmann's President Klaus Esser viewed the first bid for the company made last November as hostile. Since that time, the acquisition price has climbed from SEK 1,050 billion to SEK 1,800 billion. Björn Eisner, Ericsson key account manager for Mannesmann sees several advantages with the merger.

"It will be easier to deal with a large customer. Now we will be better able to coordinate marketing efforts and the introduction of new products. Even installation and testing of new products and networks can be coordinated," he explains.

Both Mannesmann's President and Swedish manager Lars Berg, who is responsible for the company's telecom operations were against the merger. President Klaus Esser has announced his resignation, while Lars Berg's future within the company is considered uncertain. Berg left his post as President of Swedish network operator Telia one year ago. Another Swede, Tomas Isaksson, left his job as President of Swedish mobile operator Europolitan to shoulder responsibility for Vodafone's investments in the mobile Internet.

Analysts predict a bright future for the company if the two business cultures are successfully combined. The new company will have 42 million customers, with about 29 million in Europe and 9 million in the US. The company has operations in 25 countries around the world.

Analysts also believe that Vodafone will quickly divest everything that does not belong to core operations in order to strengthen its balance sheet for major investments in new telecom networks and systems. Mannesmann's industrial operations, which are the company's roots, are therefore endangered, reports Swedish business daily Dagens Industri. Both the Mannesmann and the Vodafone shares dropped sharply on their home exchanges in Frankfurt and London on the news.

Ulrika Nybäck

This autumn, Ericsson launched its MP3 player for mobile phones, The new open compression standard can compress audio with near-CD quality. In the future, cellular networks will be an important distribution medium for music sales. This will be made possible by increased data speeds and e-commerce solutions for protected distribution of digital music.

Music from your phone

Tomorrow's mobile phones may also function as juke boxes. The security of mobile networks and increased data speeds are ideal for the distribution of digital music. These were the conclusions reached by a seminar for musicians held in Stockholm.

The music industry is concerned about the increase in illegal distribution of music over the Internet, where it is possible to download mp3 files with illegally copied music. The International Federation of the Phonographic Industry estimates illegal downloads of mp3 files at between 200,000 and 300,000 each day.

"Sales and distribution of music via the Net will definitely increase in the future. For us it's a question of making sure that there are rules and copyright protection," says Hans Lindström, President of SAMI, an interest group for Swedish artists and musicians that organized the recent Stockholm seminar.

Mikael Halén from Ericsson Radio Systems showed what increased bandwidth in WCDMA systems might mean for music distribution.

"Users are already aware that mobile phones can be used for more than talking. For content providers, such as record companies, this means entirely new opportunities since everything will be much more accessible," says Mikael Halén.

Tests of music distribution over mobile networks can start with the introduction of GPRS packet-data technology.

"During low-traffic periods, music could be sent to the subscriber's car stereo or to digital juke boxes in restaurants," says Ragnar Larsson, business developer in GSM Systems' development area, Media and Entertainment.

Ericsson is now establishing contacts with various music suppliers and is also active in SDMI (Secure Digital Music Initiative), which is an industry body and standards forum for protecting digital distribution of music.

"The wireless world is much more secure for music distribution than the Internet. Encryption is already standard in mobile networks, for example," says Ragnar Larsson.

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INDUSTRY NEWS

Instant success for new portal

➤ In the last issue of Contact, we described the new intranet portal Business Intelligence Center (BIC). Five days after opening, the site had registered more than 275,000 hits and 500 registered users.

"We are naturally extremely pleased with this response. Unfortunately, we have had some technical problems at the outset," says Eric Wedin, who works on the portal. "Hopefully, these problems will be solved before this issue of Contact is distributed."

A number of sub-folders have not functioned properly, and indexing has been less than perfect. This has led to some peculiar hits in the search function. Otherwise, most things are working well.

For those who have access to Ericsson's intranet, the BIC portal provides much news and information on Ericsson's competitors, customers and the industry in general. It is also possible to customize the search function to personal preferences, thus maximising the tool's usability.

bic.ericsson.se

Lucent presents news at Cannes

➤ US supplier Lucent unveiled two exciting new developments during the recent GSM exhibition in Cannes. One was an application for keeping track of e-post messages called Internet Message Management Application. The user can download e-mail to a mobile phone and read it as SMS messages or via a WAP browser. It is also possible to have the text read aloud via a text conversion function.

Lucent also presented a voice-controlled web browser. Lucent foresees a development whereby users create their own portals with news and stock information, for example, that allow them to access current information on subjects that interest them.

The two applications will be available later this year.

New WAP server from Nokia

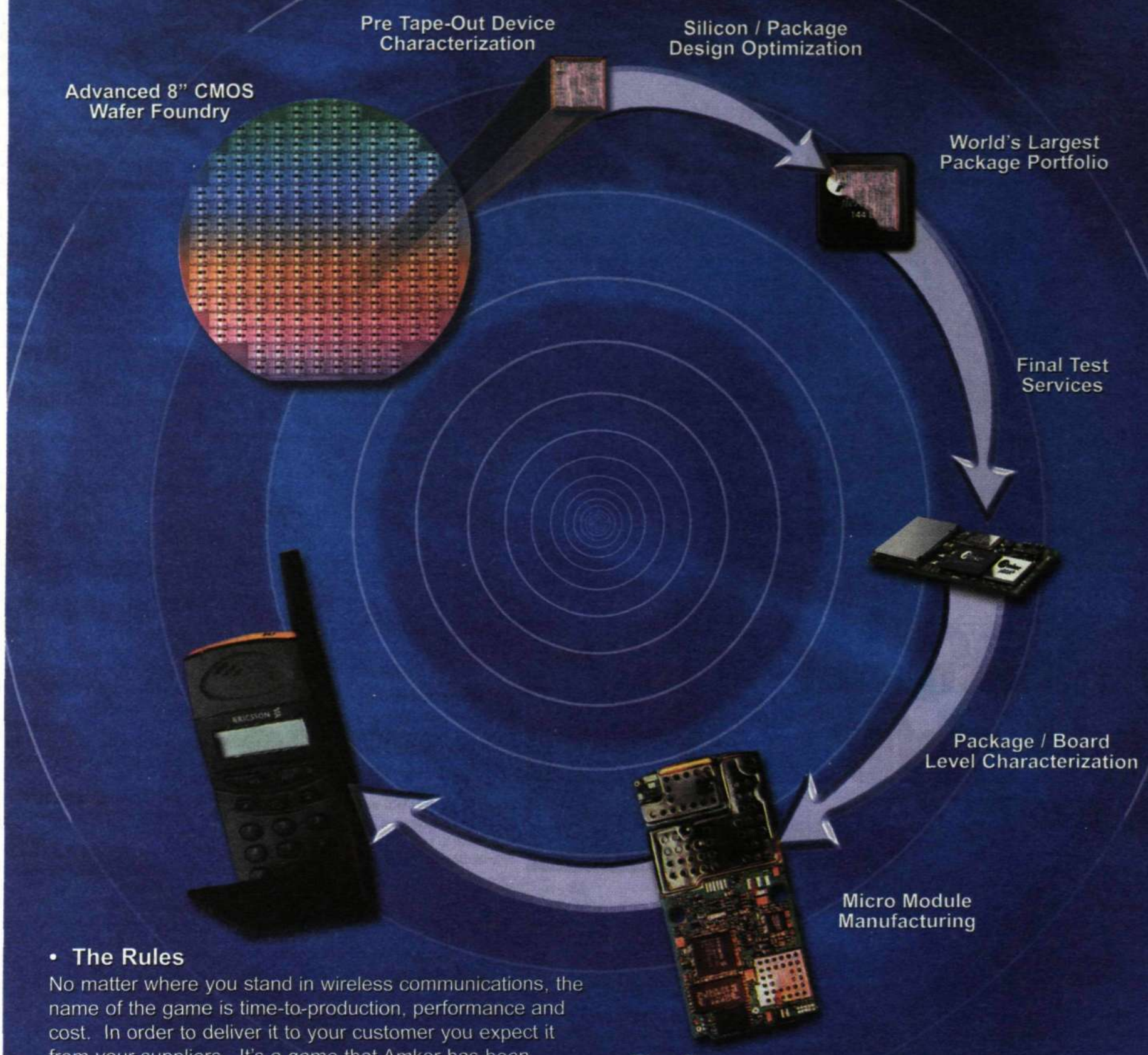
➤ During the GSM exhibition in Cannes, Nokia presented a new WAP server called Artus MAX that allows operators to customize WAP portals according to customer requests and requirements.

The server can also manage content for WAP portals and customize information. Users can easily customize information for their own WAP portals via a conventional browser. Operators can offer a wide range of WAP services and applications from which users may choose.

Nokia sells network to Danish operator

➤ The Danish operator Mobilix is purchasing a complete GPRS network from Nokia that includes infrastructure, base stations, sub-systems and services. Nokia has been a supplier to Mobilix since 1997 with deliveries including GSM and fixed networks. France Telecom is one of the shareholders in Mobilix.

Amkor Technology Plays to Win with Smaller Sizes and Added Features



- **The Rules**

No matter where you stand in wireless communications, the name of the game is time-to-production, performance and cost. In order to deliver it to your customer you expect it from your suppliers. It's a game that Amkor has been playing to win for the last thirty years.

- **The Players**

From wafer to finished phone, the Amkor team has provided the telecommunications industry with some of the key technologies that lowered the end product cost, multiplied the phone features and allowed for smaller formats through greater integration and reduced component sizes.

- **The Game**

Right from the start the winning gambit has been the right products at the right time. Amkor's worldwide presence and customer support has assured the ability to meet requirements responsively. As the world's leader in DSP foundry services and the largest provider of outsourced semiconductor test and packaging, with factories in the Philippines and Korea, Amkor is ideally suited to meet tight deadlines and innovative approaches.

- **The Score**

Amkor's customers play to win. They accept few compromises on the way to the goal. That attitude reflects Amkor's operating philosophy of shooting for the goal, on time, each time.

Amkor Technology

Amkor Technology Euroservices - S.A.R.L.
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Fax: 33.4.50.40.98.88

Enabling a Microelectronic World

www.amkor.com/ericsson1

For almost 40 years, the Cox family has represented Ericsson in Zimbabwe. With their local insights and broad technical knowledge, they are competing in a rapidly expanding telephone market.

Cox family takes care of business

In Granetside, an industrial area on the outskirts of the capital city Harare, the finishing touches are being put to a new office building – the future home of Ericom Communications, Ericsson's representative in Zimbabwe. Ericom is now investing in a larger office and hopes to be able to move in early this year.

"We'll finally be able to gather all our operations in one place," says Patrick Cox, one of the company's six managing partners. "Currently, we're spread out all over town, which causes a few problems."

You could consider Ericom a family company. Three of the six managing partners are members of the Cox family. In addition to Patrick, there is his father, Tony, and his brother, Andy.

Tony Cox was involved right from the start, back in 1961 when Zimbabwe was still known as Rhodesia and Ericsson was first establishing itself in the country. In 1969, a worldwide embargo was implemented against Rhodesia, in opposition to Ian Smith's apartheid regime. It was then that Ericsson sold the company to the directors.

Trade embargo

"From 1969 until 1980, we were completely on our own," says Patrick Cox.

The embargo years forced the company to begin its own manufacturing of certain components, and to develop a skilled repair unit, which is still a hallmark of Ericom. Several of the telephone switches sold during the 1960s are still in operation, and it is Ericom that is responsible for servicing them.

"We make calls using switches that you in Sweden threw out a long time ago," says Patrick Cox, pointing to one of the employees who is servicing a PAXB switch that is over 30 years old.

The civil war ended in 1980, a black majority assumed control of parliament and the trade embargo was lifted. However, when Ericsson tried to buy back its company, Zimbabwe's politicians said no. President Mugabe advocated a socialist state and was uninterested in foreign investments – industry should remain locally owned.

Close relationship

As a result, Ericom, or Ericsson Telephone Sales as it was called until 1997, and Ericsson reached an agreement to collaborate closely instead. This relationship has been so close, that it was really only ownership of the company that distinguished Ericom from being a part of Ericsson.

"We've always considered ourselves part of the company," says Patrick Cox. "We still talk about Ericsson in Stockholm as the 'head office'. The name Ericsson Telephone Sales shows how close the companies collaborated. No other independent company has been allowed to have Ericsson in its company name. Ericom had it for almost 30 years."

"For people here in Zimbabwe, we're synonymous with Ericsson," says Patrick Cox. "Even after our company and Ericsson reached an agreement for us to change our company name, people still believe that we are part of Ericsson. The mobile network is expanding."

Earlier this year, Ericsson signed an agreement with Zimbabwe's largest mobile phone operator, Econet. Ericsson will supply all equipment and provide servicing of base stations and switches.

Ericsson's South Africa office is overseeing the contract with Econet, even thought it was Patrick and Andy Cox who convinced Ericsson to work with Econet. The rapidly expanding mobile market also means opportunities for Ericom.

"We're a retailer for Ericsson telephones, and hope to acquire an increasing share of the market which is currently dominated by Nokia," says Patrick Cox.

Exclusively in the big cities

Approximately 150,000 Zimbabweans have mobile phone subscriptions. Of those, 70,000 use Econet and 35,000 call on Ericsson phones. Considering the poorly built, unreliable, wireline network, Ericom expects mobile telephony to continue to expand.

"But not with the same explosive growth seen in Europe," says Patrick Cox. "This is the third world, and most people will probably never use a mobile phone. Expansion is occurring almost exclusively in the bigger cities, among the middle and upper classes who can afford to call."

Buying an Ericsson 688 phone costs ZWD 11,000, excluding subscription, which corresponds to the annual salary of a housekeeper or a couple months' wages for a teacher. The wireline network is also important.

Wireless telephony will not replace the wireline network, which is Ericom's primary field. The company's 200 employees work mostly on telephone solutions for businesses. They sell, service, and upgrade switches of various sizes.

Andy Cox

140,000 in line

Patrick Cox

"We're continuing to try and compete against Zimbabwe's state-owned telephone company, whenever they want to expand the fixed telephone network," says Patrick Cox. Currently, Ericom is bidding on a 20,000-line telephone switch for Harare.

Considering that 140,000 Zimbabweans are waiting in line to get regular phone service, the new switch will not go far. The fixed network is seriously undersized, and the state-run company has a difficult time meeting the needs of the market.

"Currently, Zimbabwe's economy is in a free-fall," says Patrick Cox, "and almost everything is uncertain here. But things have to turn around sometime, and then the telephone market will take off again, even the fixed network."

Johan Romare, freelance journalist
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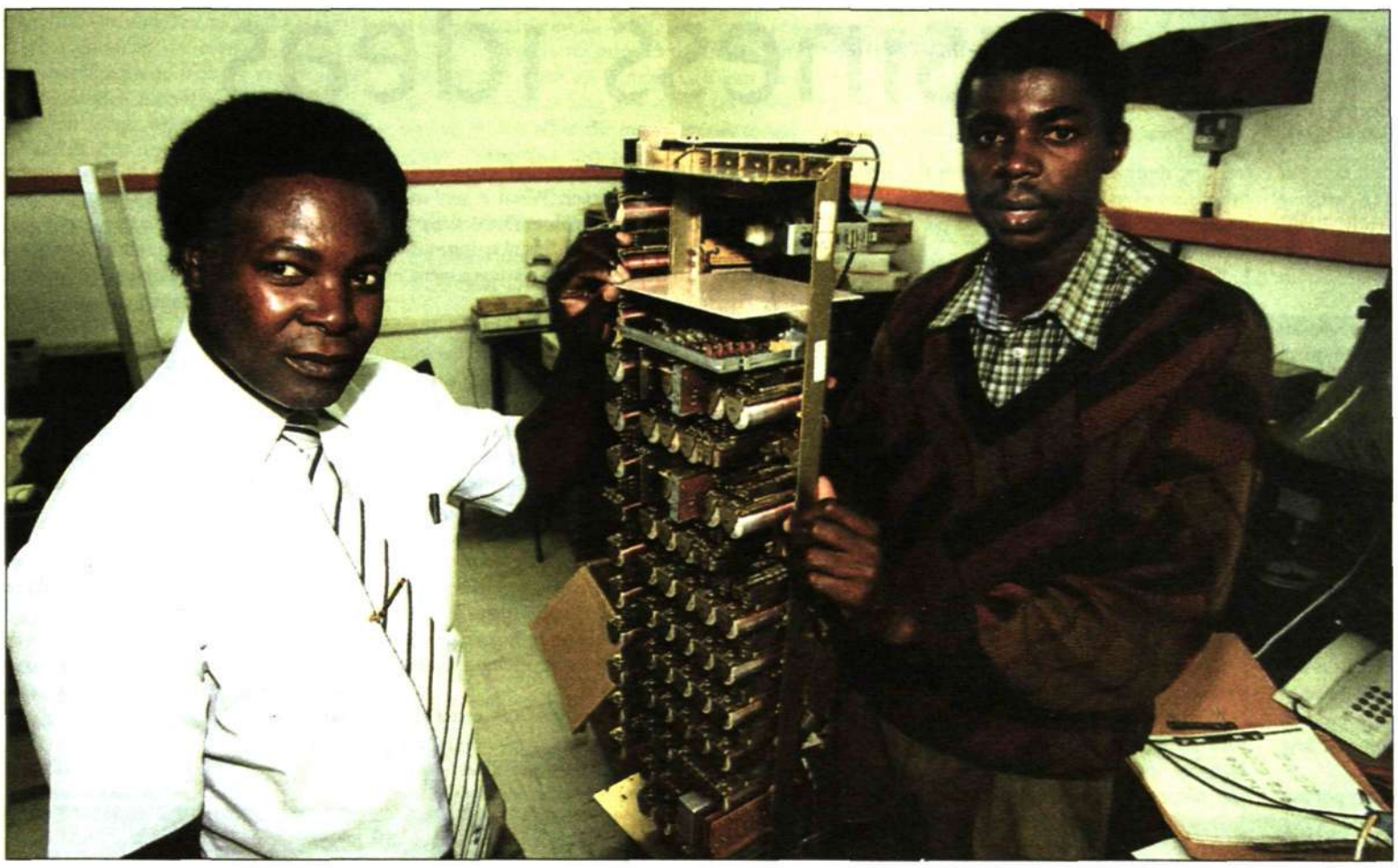

Many old Ericsson telephone switches are still in operation in Zimbabwe today. During the many years of the embargo, Ericom developed a skilled repair unit. Thomas Zharo and George Risinamhodzi show off an AMD 516 PABX switch from the 1960s.

Photo: Per Mattson

"With increasingly short lead times, there are no opportunities within regular business operations to work through ideas not directly related to the current product portfolio. That's where we come in," says Anders Friman, head of Ericsson Business Innovation, which functions as an internal venture capital company. Photo: Lars Åström

A greenhouse or incubator for unconventional ideas. That is how Ericsson Business Innovation operates, encouraging innovators and entrepreneurs within the company.

Working in small, independent units, they have the opportunity to develop entirely new products and services.

Independent units foster creative business ideas

New ways of thinking are important elements of success in the ever-changing telecom industry. Consequently, Ericsson is focusing heavily on capturing unusual new business ideas and preventing innovators from leaving the company.

Business Innovation has been in existence for just over a year now, sorting under the Network Operators business segment. It serves as a hub for creative ideas from throughout the company.

"We operate as an internal venture capital company. Our task is to keep track of those ideas that do not currently fit into Ericsson's structure, but which could become core operations in the future," says Anders Friman, head of Business Innovation, which employs ten people.

The unit evaluates new ideas, tests them with real clients and develops new business models.

"We're on the lookout over a broad area, since we don't know what the next core operations will be. Our goal is to rapidly bring innovations to market and move them into their own product units or business units within the company," says Anders Friman.

According to Friman, it is extremely important to test projects on a small scale, since an innovative climate requires fast, informal decision-making routines. Ideas, along with the innovators themselves, are first tested in small-scale projects or innovation cells, for a period of one to three months.

That phase is used to determine what is technically feasible. At the same time, a team is assembled and a business plan is drawn up, forming the basis for whether an idea should be pursued in the form of a venture.

Separate companies within Ericsson

"A venture is controlled and run as if it were a separate company within Ericsson, but with a few outside representatives on the board. The advantage of this arrangement is the ability to be able to make the same rapid decisions as in a small company, but with the security that comes from a large company's good reputation, market presence and investment strength," says Anders Friman.

Currently, Business Innovation has five innovation cells and seven ventures.

"The areas we're looking at include infrastructure equipment for on-line computer games, business opportunities for providing services to the automotive industry and Internet traffic management system," says Anders Friman.

Yet another venture, Connect Things, was spun off as its own company last autumn, with Ericsson as a joint owner. When a venture is determined to no longer be a potential part of Ericsson's core operations, Business Innovation is able to realize a profit on its investment by divesting itself of the venture.

The business concept behind Connect Things is to simplify information searches on the Internet by linking all products labeled with a unique barcode to information on the Internet. Several major companies such as Electrolux, AstraZeneca and Sony Music have joined the system.

"We don't have a monopoly on testing new ideas within the company. My vision is that all local companies and business units will operate their own innovation cells within their respective core areas. That way, Ericsson would be able to significantly increase the flow of ideas. The main task of Business Innovation is to pursue those ideas that don't fit into the existing business units," says Anders Friman.

He says that the flow of ideas to Business Innovation is good. What the unit needs now is several people who can pursue those ideas – intrapreneurs. These people are the company's internal entrepreneurs.

"The role of an intrapreneur involves taking a concept and developing it into a finished product. Our program offers a unique opportunity to become part of a leadership training program, with responsibly for the entire flow of operations – from product development to manufacturing to business development and sales," says Anders Friman.

Program encourages development

Together with several other major Swedish companies, Ericsson has also started a skills development program to encourage and train qualified intrapreneurs within the company. The program, Creating new business, is operated by Chalmers University of Technology in Gothenburg. Four people from each company participate in the six-month program, and are actively involved in a current project.

"We will be offering the program again this spring, and there are also plans to start an internal version of the training program," says Anders Friman.

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Innovation key to attracting new talent to Ericsson

The future winners of the telecom and datacom industries are already working hard to expand beyond their traditional product areas. Development of products and services can no longer be based only on what has been done in the past, according to Bernt Ericson, Vice President of research and innovation at Ericsson.

"In order to remain a leader in the future, it's incredibly important that we actively seek out and test new ideas. We can't simply focus on existing customers and products," says Bernt Ericson.

Changes occurring within the telecom, datacom and media industries are generating entirely new business opportunities for Ericsson.

"We're working in an industry with unlimited opportunity. While auto manufacturers, for example, have a physical limit on volume to consider, we're able to continually find new applications and products," says Bernt Ericson.

Students more demanding

As head of research, Bernt Ericson oversees contacts with colleges and universities. He has noticed an emerging trend towards more independent thinking within higher education. Students learn about entrepreneurship and see how newly formed companies are transformed into overnight stock market sensations. As a result, they place great expectations on the companies that are of interest to them.

"We're on the verge of a fierce battle for expertise in the future. We need to actively show that Ericsson is a company that provides opportunities to do unexpected things, that it is here where ideas can best be nurtured and generate revenues. That's how we can attract the most dynamic, most creative individuals," according to Bernt Ericson, who also advocates a pay system in the form of options to encourage innovators and entrepreneurs.

Incubator at every unit

In his opinion, the efforts of Ericsson Business Innovation are a good example of the company's new entrepreneurial spirit.

"For a long time throughout the company, we've encouraged people with innovative ideas. At Business Innovation, we've assembled a professional process and an external network, capable of dealing with new ideas. This is a strategic investment, designed to develop new business concepts," says Bernt Ericson.

"Business Innovation should operate as the company's right hand, evaluating ideas that the overall organization can't deal with or test on its own. At the same time, however, it's important to place demands on every unit to create an environment that promotes creativity. That's why there should be incubators to test ideas at every company and unit," says Bernt Ericson.

"When developing today's products there's little room to play with new ideas. That's why it's important that we have a process to identify and promote new ideas," says Bernt Ericson.

He points out that at the multi-product corporation 3M, every unit has its own venture capital to develop ideas within the framework of their area of responsibility. The higher up within the organization you go, the more venture capital there is available.

"If an idea doesn't fit into a unit, it is referred upwards within the organization, to a level that has a broader area of responsibility. The company is constantly tracking how many ideas are being developed within each unit, a practice that creates an innovative atmosphere," explains Bernt Ericson.

Cooperative development

The key to success is finding areas of innovation that reflect real customer needs.

"Ericsson has a unique market presence. Tapping into the resources of companies from our various market areas, we could systematically identify important customers within various segments and fields. By utilizing the ideas and needs of those customers, we could jointly test various technologies and solutions in strategic areas that could eventually lead to new core business operations," says Bernt Ericson.

"At the same time, we need to get better at taking advantage of the potential that exists outside of Ericsson, by investing in new start-ups that are operating in interesting fields. We can't develop everything ourselves, and by supporting other companies at an early stage, we can direct them, so that the products they develop are best adapted to our needs."

Nils Sundström

Simple filter enables Internet access

"I feel privileged. It's very stimulating to have overall control of everything including product development, production, market responsibility, marketing and business development," says Staffan Söderlund, head of Ericsson's Multilet venture, which has devised a simple Internet solution for apartment buildings.

By utilizing existing cable TV coaxial networks, households can have inexpensive access to both the Internet and cable television. The solution, known as Multilet (an abbreviation of multiple outlet), provides up to 10 megabits-per-second service to every apartment, allowing access to new services such as pay-per-view TV, real-time video and high-speed Internet access.

"There are numerous technical solutions for bringing broadband into apartment buildings. The difficulty arises when trying to access that last little bit into each apartment. Our solution provides a simple alternative for customers," says Staffan Söderlund.

The technology combines two realms – local data networks and cable television networks. Coaxial cables from an existing cable TV network are utilized to form a packet-switched network, operating using the Ethernet local network standard. This enables every apartment to have access to the Internet.

Television channels use the 47 to 860 MHz wavelengths, while Ethernet operates on the 0 to 25 MHz frequencies. The signals are sent through the same cable and separated at each apartment by a filter.

"The filter consists of simple components such as coils, capacitors and resistors, making the network robust and stable," says innovator Dan Sahlin.

He developed the idea for the technique after his tenant-owner association looked into the direct broadband access market. At the time, in 1997, there were two alternatives – to either buy cable TV modems or install a separate network.

A simple solution brings Internet access to apartment buildings. Dan Sahlin and Staffan Söderlund are the brains behind Ericsson's new venture, Multilet. Their product is a filter that utilizes cable TV networks to provide fast Internet access. Photo: Lars Åström

"Our tenant-owner association chose the latter alternative. However, I still thought it should be possible to utilize the existing cable TV network without having to buy a cable modem," explains Dan Sahlin, who later sought a patent for his filter solution.

The business concept, which was supported by Ericsson Business Innovation, has been conducted as a separate venture since last autumn, employing five people full-time with another ten people involved. A test system has been in operation for the past six months in Stockholm.

"We've sold Multilet to a dozen or so different housing companies, and even have a distribution agreement with Swedia Networks, a subsidiary of Telia," says Staffan Söderlund.

Currently, the solution works with buildings that have so-called star networks, where every apartment has its own line from a central exchange within the building. However, a solution for other television networks, so-called cascade networks, is under development.

"Access to the Ericsson name and the company's reputation have been invaluable in forming our customer contacts. Being able to bend the rules and test somewhat unusual ideas is essential to an innovative atmosphere," says Staffan Söderlund.

Nils Sundström

www.multilet.com

Responsibility attracts entrepreneurs

Feeling confident about one's own skills and passionate about the actual concept. Those abilities have led Kent Eric Lång and his colleagues all the way from innovation cell status to becoming a new core operation.

Kent Eric Lång hates to lose, even when it comes to pinball. "I think it's easier to dare to start up something new if you enjoy challenges of all kinds. You also need to be fired up about the actual concept right from the start," he says. Photo: Ulrika Nybäck

The Gothenburg-based innovation cell, Mobile e-services, will soon take the step of becoming its own product unit, the only innovation cell at Ericsson that has so far succeeded in doing so since Business Innovation, Ericsson's center for entrepreneurs, began operation just over a year ago.

Mobile e-services is a core unit within Ericsson Microwave Systems and has developed numerous mobile services for automobiles, based on the e-box concept. With a vehicle unit containing a computer, GSM telephone and satellite-based GPS positioning system, motorists can have their e-mail read to them in their car, receive traffic information, let their kids play games and watch videos in the backseat and much more. When the cell began operations, the basic concept for e-box technology – used to control and monitor intelligent appliances within the home – was already in existence. Two years ago, Kent Eric Lång and his colleagues received the task of developing a similar system for automobiles.

From consultant to entrepreneur

Kent Eric Lång has been in charge of Mobile e-services since its inception. He left his job as a consultant with the Swedish National Road Administration in order to try something completely new. Although his job at Ericsson involves technology, his primary task has not been to develop new solutions, but rather to adapt existing ones to the automotive environment. He knew that his new job would involve overall responsibility, with an emphasis on finding partners interested in collaborating and marketing the solutions.

"I took this job because I knew that I'd be able to see and influence the big picture in a new way. It has certainly been a good managerial school, teaching me lots about marketing, delegating responsibility and how to initiate new partnerships," says Kent Eric Lång.

Three-industry partnership

Although he is not yet at liberty to divulge exactly which partnerships the unit has developed, he acknowledges that they are with companies from the automotive, Internet and software industries. Three industries that have, in many respects, dramatically different business cultures, depending on the various situations they operate in.

"Automobile manufacturers have long decision-making processes and development cycles that require long-term planning to develop new vehicle models or implement new systems. Within the Internet and software world, everything happens extremely fast, so that a popular solution one month might not be the next. As a result, it's been a little bit of a puzzle at times, to understand and try to bridge these different cultures," explains Lång.

"At the same time, it's important to initiate discussions with companies in these fields. They've led to several exciting partnerships that will be unveiled in the near future."

Kent Eric Lång has many words of advice for Ericsson employees contemplating starting a new innovation cell.

"The most important thing is to truly believe in the concept that will eventually become a product. It's also important that the first team to start working on the project has both technical and marketing skills. Perhaps a researcher or technical specialist together with a marketer with a few years experience."

"It may sound like a cliché to say that you have to keep thinking outside the box, but that can be the difference between a failure and success. Cooperation is the key word."

"No matter how hard it feels, sometimes you have to abandon your best idea when it seems like you won't get any farther. It's important to try and understand the changing needs of the market."

Same vision needed

"It's important to initiate collaborations with companies that share the same vision in order to have depth, stability, shared investments and risks and to quickly make the operation profitable," according to Kent Eric Lång.

He acknowledges that the road towards a product unit is not a straight one, but when asked as to whether he would follow the same route again, his answer is a resounding yes.

"I'd probably try to avoid some mistakes next time. At least I think I would," he says with a wry smile.

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Kent Eric Lång tests out new ways of spending time in the car. Soon, you will be able to have your e-mail read to you or to play videos for your kids while driving or stuck in traffic. The Mobile e-services innovation cell is forming a new product unit. Photo: Kamerareportage

Ralph Niesen and Adrian Crouch are working on mobile application design. Adrian is pictured showing a Delphi Pad, a demonstration computer with software, which will eventually be housed in a phone or hand-held computer. It will be possible to use it to control most functions and appliances in the home, such as: lighting, the video, the TV and the refrigerator. It can also be used as a conventional computer.

Photo: Frank Styevko

The task is to find new paths in the mobile data jungle. In order to understand the terrain and avoid the wrong route, working closely with the customers and the market is of paramount importance. This is the 42nd Precinct, the Cyberlab at Ericsson in Australia.

Cool solutions are born on the 42nd floor

In the fifty-storey, glass-clad Ericsson skyscraper in Melbourne, an entire floor has been devoted to such activities as new thinking and innovation, new wireless mobile data solutions and exciting WAP applications.

To reach the Cyberlab, you have to go all the way to the forty-second floor. There is a magnificent view over the city, with its population of three million. This entire floor is different from the rest of the building. Here can be found the electronic home, known simply as e-home.

A complete room is furnished like a home, with furniture, TV, hand-held computer, various phones and a mass of gadgets, which provide a simple display of the way in which the technology of today and tomorrow affects, and may come to affect, the life of the common man. There is no conventional meeting room on the forty-second floor, at meetings, people sit down in a bright room with colorful, inviting sofas.

Customer focus reflected

One of the rooms is reserved exclusively for customer presentations, the Cyber Theatre, with its multimedia presentation facilities. This is an open-plan office, nobody sits in a room with a door. Not even the boss.

The Cyberlab is called the 42nd Precinct to convey a 'city' or 'community' feel. The lab is not a single business unit, and the teams based here are 'tenants' not permanent residents. 42nd simply relates to the floor location. Peter Rule is the so called "Mayor" of the floor. He has been given this name because he does not have direct management authority over all the teams, but it is his task to ensure that everyone is working together on the right projects, towards strategic objectives, and with the right customers.

"We are showing both the general public and our customers that Ericsson Australia is not only about networks and phones, but that we are also innovators, open to new ideas and cooperation, and that we are experts at wireless data communications," Peter Rule explains.

Creative new group

"All the teams that work in the Precinct were already part of Ericsson Australia's core organisation, but in bringing them together in this environment we get some great synergies and the opportunity for powerful innovation."

An outstanding feature of the Cyberlab at Ericsson Australia is its closeness to the customers. Almost all projects are completely or partially customer-financed. Every day the lab receives visits from customers or partners for discussions about business opportunities.

42nd Precinct is currently working with around twenty external companies within the areas of finance, media, entertainment, music and the Internet. A series of internal cooperation projects are taking place in parallel. Both internal and external cooperation projects comprise such activities as WAP applications development, further development of the Upfront Internet customer service solution, various wireless solutions for the home-based e-box solution, Bluetooth, wireless e-commerce and GPRS technology (packet-linked wireless technology). The 42nd Precinct Cyberlab was officially opened one-and-a-half years ago and its future strategy is marked out.

"We intend to be the market leader in mobile data communications," Peter Rule explains. "Mobile applications are already here, mobile e-commerce is around the corner, and content and communications will begin to merge."

"That is why cooperation with content companies is so important. There is a huge amount of useful and fun applications and services to encourage consumers to buy the new products."

WAP phones recommend music

"In about a year, your WAP telephone could be so smart that it knows your taste in music," Peter Rule continues. "It will be able to make recommendations to you for music you might like to hear, and also where to hear or buy it. We see this type of content management as being very exciting for upcoming 3G applications, and we are helping to develop this function in cooperation with a company in the music industry."

It is difficult to predict which products and solutions will make the big time, but by working closely with companies and the market, Cyberlab is helping to identify future trends to keep Ericsson Australia ahead of its competition.

"I believe that there will be an abundance of different computers and phones for various areas of use within a few years. The WAP phone and the hand-held computer are just the beginning," Peter Rule predicts.

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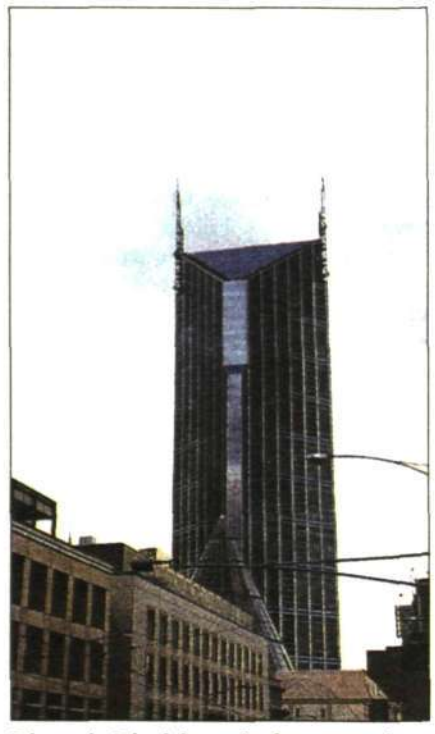
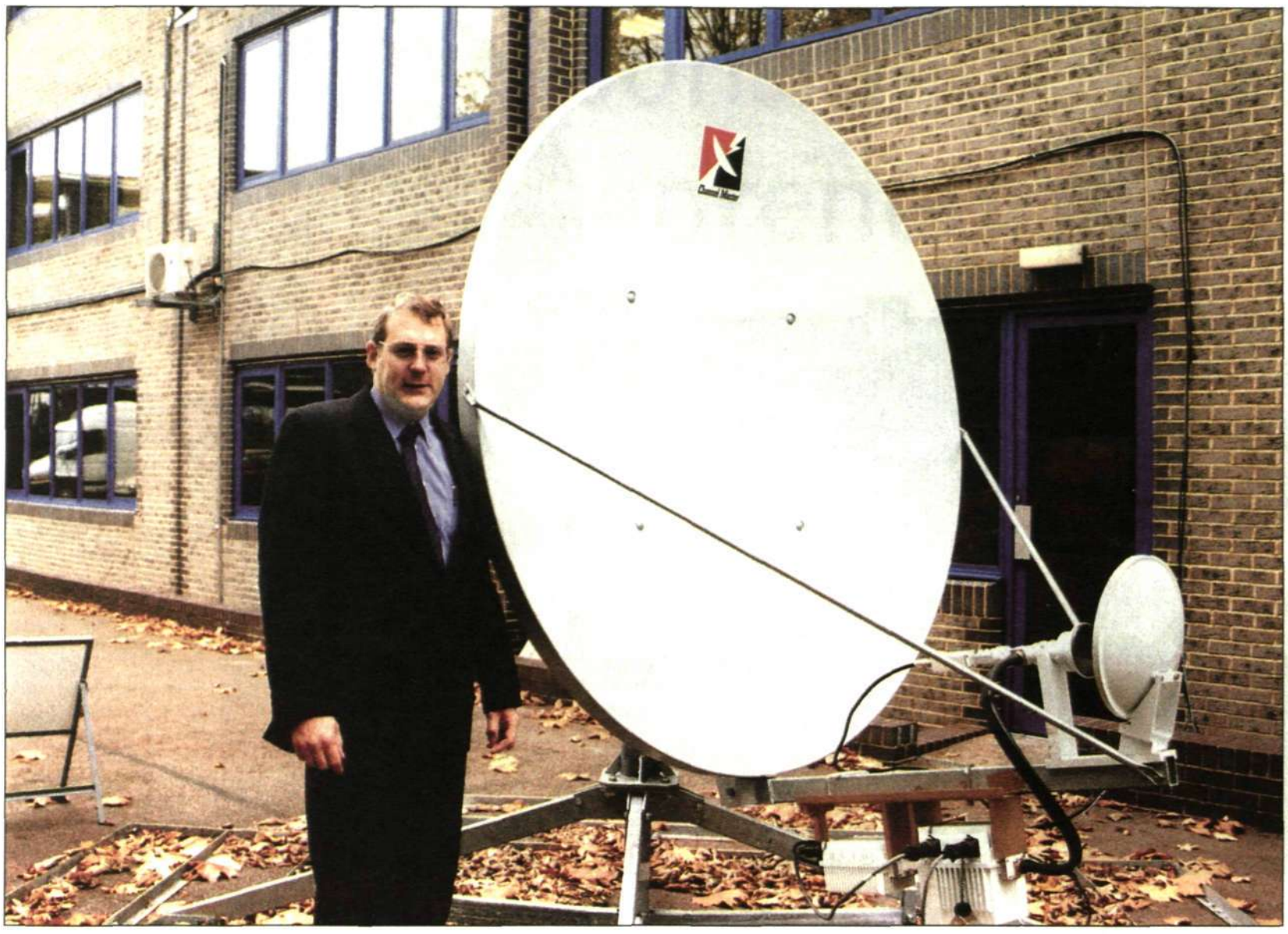
WHAT THE CYBERLAB DOES

- Upfront Solutions (various call center solutions)
- Integration center
- Network design
- Zopps ISP
- Radio Network Design
- Voice Over IP application (Development team)
- Future Development – including mobile application design group (Maddog) & e-home team
- Multimedia Hotel (Ericsson start-up in a joint venture with SimsonMedia, a local media company)
- Enterprise Data
- Business Consulting
- Connexions (CRM Consulting Group)
- Mayor's Office (Strategy & Marketing)
- Innovations Hub

www.ericsson.com.au/42ndPrecinct



Ericsson's Cyberlab, on the forty-second floor of the company's skyscraper in Melbourne, is where the applications of the future are created. Photo: Ulrika Nybäck



"We believe there is a promising niche market for the Ericsson Linkway satellite system, which sends data communications via satellite. It is an ideal solution for enterprise, as well as other users," says Peter Lagesse, President of Ericsson Componedex in Milton Keynes, UK.

Photo: Gunilla Tamm

Componedex hopes to sell totally new satellite product

A small, creative and informal company, currently with systems for nationwide paging as its base, but with a future in data communications via satellite. Ericsson Componedex in Milton Keynes, UK., is placing its confidence and hopes in a new range of satellite products.

Many companies started as a few ideas at a kitchen table and Componedex is no exception. Peter Lagesse and Bob Morris, the two founders, are still in charge of the company, which has 35 employees and is located in Milton Keynes, halfway between London and Birmingham.

"Nineteen years ago, we began developing products for protocol analysis in data communications. We eventually moved into nationwide paging," says Peter Lagesse, who is President of Ericsson Componedex. "It all began when we were contracted to make the test equipment for the paging system to be constructed by Mercury and we ended up building the entire network."

Reorganization

In 1993, the then Ericsson company Magnetic purchased Componedex as a complement to its paging operations. It then became Ericsson Componedex.

As part of a reorganization of Ericsson's paging operations last spring, responsibility for base station operations was transferred from Ericsson Radio Messaging to Componedex, which had already been assigned responsibility for distribution networks.

In purely practical terms, this means that Componedex now has direct customer contacts, just as it had before it was acquired by Ericsson.

Entrepreneurial spirit is one of the main features of Componedex as a company and, with its informal and flexible organization, the customer is always in focus. Personnel turnover is almost non-existent and the number of employees is just right.

"Paging operations are our base and it is important that we take care of the customers Ericsson has," Peter Lagesse explains, adding that the company serves operators over the entire world. "There are particularly strong contacts with the UK, Europe and China. Although paging operations are now a mature market, business is taking place and the late autumn brought, for example, an order from China."

Test center in Milton Keynes

Componedex is involved in development, marketing, production and support. There is also a test and repair center in Milton Keynes.

Transmitters for paging systems are manufactured in Nynäshamn, south of Stockholm, while control units are made in Milton Keynes.

"Before a system is delivered, it is always tested at our facilities for a month," says Bob Morris, who is technical director.

The application of satellites for paging is a solution that has been used for many years.

"If a large system with many base stations is involved, it is often more economical to use satellite transmission instead of radio links or cable. If a system has more than 30 base stations, then it is worth using satellite," says Douglas Watson, who is responsible for sales and marketing at Componedex.

Totally new system

The Ericsson Linkway satellite system is an entirely new product for data communication via satellite, which Ericsson Componedex has high hopes for.

"Although we will continue to work with paging systems in the future, in order to provide support for our customers, we believe that there is a niche market for Linkway. It is an extremely suitable product for our company and our portfolio," says Peter Lagesse. He believes that enterprise will form the largest market for data communications via satellite. Linkway is produced by an American company and it was exhibited at Telecom99 last autumn, but not at the Ericsson stand.

"We demonstrated the product by broadcasting video conferences," says Peter Lagesse. "All of 1999 was used to prepare the introduction of Linkway. The activities included testing the system and writing the documentation, and now everything is ready for the launch and selling."

"Setting up the system is a fast process and several major operators, such as the British company BT and Telia in Sweden, are interested in testing Linkway," Douglas Watson adds.

Global organization an advantage

Linkway is not exclusively an Ericsson product, but Ericsson has a major advantage over competitors because of its global organization.

"This means that we are able to offer local support, a possibility that the other companies don't possess," Peter Lagesse explains. Ericsson also has sales people located throughout the world and he believes that they have excellent opportunities to find interesting business openings for Ericsson Linkway.

"We are certainly a small company, but we are part of a large international organization and that is something we should make use of," he concludes.

Bob Morris is technical director at Componodex

Douglas Watson is head of sales and marketing

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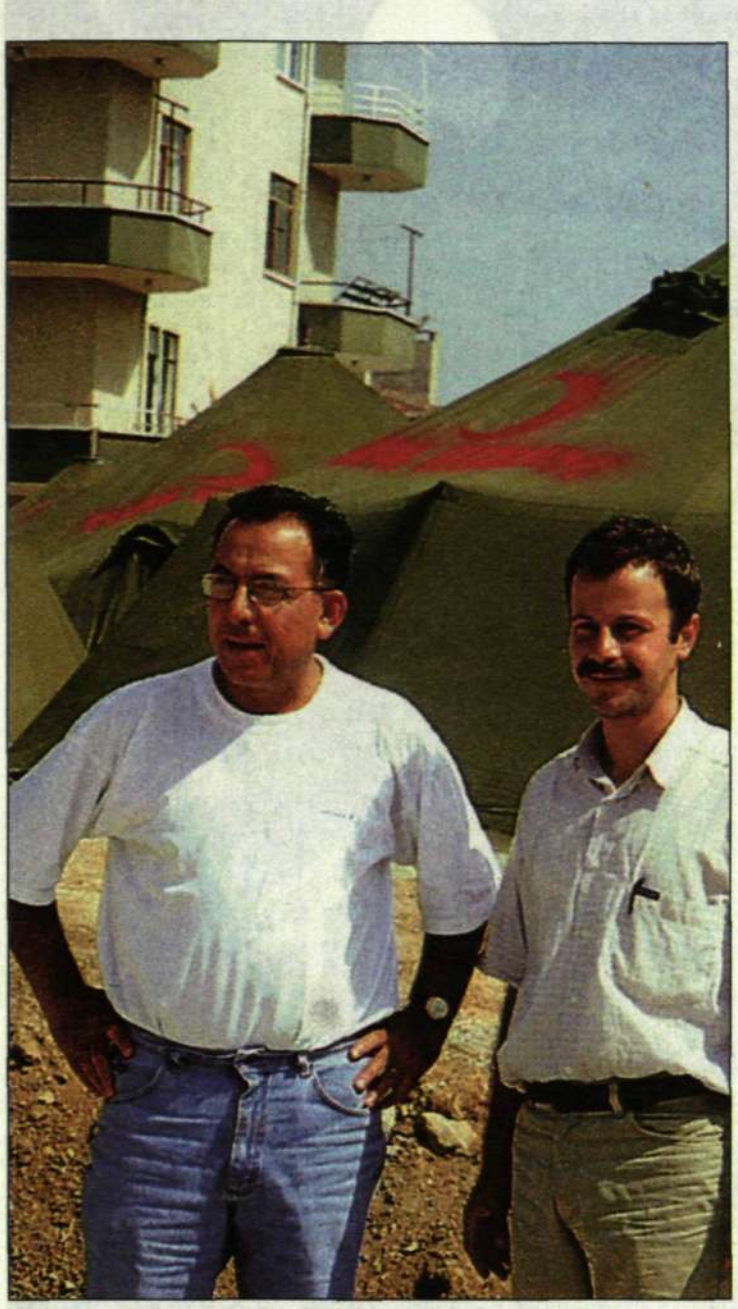

Quake victims resigned to tent city for at least a year

Employees at Ericsson quickly took the initiative to assist in relief efforts following the major earthquake in Turkey last August. This included erecting a small tent city in the severely affected village of Degirmendere. Some 200 people still reside there.

At 3 o'clock in the morning last August 17, Turkey was shaken by one of the strongest earthquakes of the 20th century. Over 17,000 people died as a result of the earthquake. Ericsson quickly provided assistance by repairing base stations. The company also donated mobile phones to a communications center established by Ericsson's partner, Turkcell. Ericsson was also involved in procuring Swedish military tents together with the Red Cross. An entire tent city was erected for approximately 400 people in the village of Degirmendere.

Halit Gunes, of Ericsson in Turkey, recounts that in the beginning there were more than 400 villagers living in the 80 tents set up there. Even now, in winter, about half of the people remain.

"Ericsson has also assisted in providing showers and a kitchen as well as a temporary school building," says Halit Gunes.

These are all much needed since reconstruction work is proceeding slowly. Many people will have to count on living in the tents for at least a year. Dag Nielsen, of Ericsson Radio Systems in Stockholm, was involved in the efforts and helped organize. He is familiar with the Turkish market and has previously worked for the Red Cross and the United Nations.

"The Red Cross borrowed tents from the Swedish army under the supervision of the Swedish government. Ericsson employees coordinated relief work together with local volunteer organizations," says Dag Nielsen.

More than 600,000 people were left homeless following the earthquake, including many who still live in tents.

Halit Gunes, left, of Ericsson in Turkey, assisted in constructing a tent city for 400 people in the Turkish village Degirmendere, following last August's earthquake. Photo: Dag Nielsen

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Music is the way to youth

Music is a global language, widely appreciated by modern youth. Using music as a medium to help reach younger mobile phone users, Ericsson has sponsored the Swedish Grammis Gala in Stockholm.

"Ericsson's involvement in the Grammis Gala was presented within the context of the 'Make Yourself Heard' campaign," says Mattias Schedvin, head of marketing communications at Consumer Products in Sweden.

The Grammis Gala was hosted for the eighteenth time by the music industry through the International Federation of Phonograph Industry (IFPI).

The Gala included performances by numerous artists and was broadcast live on swedish TV.

"Our participation in the Grammis Gala involves more than simply putting up our signs for the event. We want to establish relations with young people who are interested in music, as well as establish a working relationship with the Swedish music industry," says Mattias Schedvin.

The Gala is just one event in a broader initiative by Ericsson focusing on the music industry, that will culminate in November with the MTV European Music Awards – the "Oscars" of the music industry.

Last year, Ericsson was one of four main sponsors for the European Music Awards.

The company will be involved again this year when the awards ceremony will be held at the Stockholm Globe Arena. In addition to the Grammis and MTV Galas, Ericsson also sponsors local music activities such as clubs, music festivals and collaborations with radio stations.

Ericsson's activities within the field of music are part of the company's strategy to establish relationships with younger target audiences. Music is an important identifying factor for young people, crossing national and social boundaries.

The girls in Sahara Hotnights competed against the more established guys in Kent for the Grammis award. Photo: Linell

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ERIC & SON

NOTEWORTHY

E-challenge all over Europe

Ericsson is sponsoring E-challenge, a contest for web entrepreneurs that has grown this year from simply being a Swedish phenomenon to a European one. It's not the prizes that are the most important, but rather the opportunity for entrepreneurs to receive publicity and meet potential investors.

"It will be exciting to see the level of the European contributions," says Peter Olson, one of the jurors, who is head of Business Development at Ericsson's Europe, Africa and the Middle East market area.

The contest is arranged by the Swedish venture capital company E-Chron. The goal is to provide Internet entrepreneurs the opportunity to receive venture capital.

Among the sponsors are companies such as Lotus, Hewlett-Packard and Ernst & Young.

Successful finalists

Several of last year's finalists have been very successful. That has especially been true of the web service Dressmart, which sells men's clothing to businessmen who don't have time to go clothing shopping in stores.

Letsbuyit has also grown enormously, profiting from a business concept known as coshopping, where Letsbuyit negotiates favorable prices for its members.

Last year's winner, ZoomOn, saw its market value increase by SEK 100 million over the past year.

An important catalyst

"We're seriously focusing on E-challenge. Among other things, we're serving as hosts for a kickoff meeting being arranged at the beginning of February in London," says Peter Olson.

"We see E-challenge as an important catalyst in identifying and promoting the next generation of Internet companies, which will be important in making the mobile Internet world that Ericsson is investing in, be as successful as possible."

February 29 is the last day for submissions to this year's contest. From the pool of contestants, 150 semi-finalists will be selected.

Meetings throughout Europe

The 15 finalists will participate in an awards ceremony on May 16-17 in Stockholm and Helsinki.

"The main advantage of participating in this contest is the opportunity to receive attention from the media and the chance to establish contacts with investors," says Peter Olson.

Kickoff-meetings are being held in a number of locations throughout Europe, including Amsterdam, Copenhagen, Oslo, Munich, Sophia Antipolis and Stockholm, starting at the beginning of February.

Mats Lundström
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www.e-chron.com

Your idea may be the next big thing

Sometimes great ideas arise from everyday routines.

Take Bluetooth, the technology that connects laptops, mobile telephones and other devices via short-range radio. The idea first surfaced when the staff at the Ericsson accessories unit in Lund, Sweden, wondered if there was a less cumbersome way to connect devices than using cables. Today, Bluetooth is a technology that promises to radically change business and home networks.

http://bi.ericsson.se

At Business Innovation, we're looking for new ideas—radical or otherwise—that can be turned into new businesses.

If you have an idea that has commercial potential, we'd like to hear from you. A good idea will receive all the support needed—financial, organizational, marketing and so on—to realize its full potential.

Who knows—your idea may be the next big thing.

Business Innovation

ERICSSON

vacancies AT ERICSSON

■ This is a selection of vacancies within the Ericsson corporation. They are also published on http://www.ericsson.se/jobs/international.shtml, International Openings, updated every second week.

To advertise: mail your adverts to employment.adverts@lme.ericsson.se.

Contact No. 2 2000 **Updated February 7**

OY LM ERICSSON AB

The IP Solutions unit at Telecom R&D of Oy L M Ericsson Ab in Finland develops telecom and datacom convergence solutions based on the IP-technology. At the moment our most important areas are the creation of Media Gateway Controller architecture as a part of Ericsson's Open Network Gateway solution and the development of IP Security (IPSec) functions to Ericsson's network solutions.

Our operations are growing and hence the IP Solutions unit is looking to fill the following positions in Jorvas, Finland.

Technical Project Coordinator

● In this position you will be responsible for technical coordination of different Internet/IP- related projects. This challenging position requires that you have fundamental programming, system and project experience of several years. You should also have international experience to work in our international team and communicate with Ericsson colleagues outside Finland.

We are looking for someone having a university degree, preferably M.Sc. or similar and very good written and oral skills in English. We expect a very good knowledge and experience in both UNIX-based systems and platforms (preferably SUN/Solaris workstations) and C/C++ programming languages. The fundamental knowledge of telecommunication protocols (such as SIP, H.323, SNMP and SS7 for instance) and Internet/IP techniques and protocols are required in this technically demanding position. It is a plus to have acquired international experience and proven technical leadership skills already.

We presume, that you are open-minded and flexible. Some travelling is necessary.

Contact: Timo Saija, Section Manager, IP Solutions, Oy L M Ericsson Ab, 02420 Jorvas, Finland. +358 9 299 3139, +358 40 729 3139, timo.saija@lmf.ericsson.se.

IPSec Technical Expert

Ericsson IPSec Competence Center, IPSecCC, is located in Finland. It is responsible for maintaining IPSec competence for development projects at Ericsson. IPSecCC owns IPSec and IKE implementations (IKE is sourced from SSH) that are available for Ericsson projects for free. We have an interoperability laboratory with the state-of-the-art equipments.

● Our technical experts are responsible for following up and contributing the latest IPSec situation in IETF. Futhermore they maintain IPSec reference implementation for several platforms and discuss of different implementation architectures applicable for different projects at Ericsson.

We expect that you are interested in Internet security and have a good knowledge of basic Internet protocols and their applications. Knowledge of general security questions especially in the IPSec area is greatly appreciated.

We appreciate the knowledge of IP projects in Ericsson. You have to be very capable in communicating with Ericsson product units. Some travelling is necessary. Ability to publish results in a very readable format is an advantage.

Contact: Esa Turtiainen, Manager, Ericsson IPSec Competence Center, Oy L M Ericsson Ab, 02420 Jorvas, Finland, +358 9 299 3616, +358 40 561 3517, esa.turtiainen@lmf.ericsson.se.

ERICSSON LTD, GUILDFORD, UK

Snr / Data Transcript Engineers

The data transcript section forms part of the Operations Services department. The section is responsible for providing all data required for commissioning, integration verification & acceptance (IVA) of new switches, extensions, cellular parameter data for integrating and commission (I&C) of new cell sites, cellular parameter data for optimisation of cellular networks, and implementation of new software / hardware functionality. The data transcript section are responsible for 3 major customers: One2One, Cellnet and ICO.

● The data transcript engineers are responsible for the creation and adaptation of the exchange dependent data (MML) files for AXE systems in all previously mentioned areas. They will be responsible for creating procedural documentation and service level agreements where required and ensuring they are adhered to. They will continuously strive to improve and develop new and existing process. They will actively seek to highlight and develop improvements in data transcript tools. The engineers will be responsible for working as part of a team and maintaining good working relationships within the team and with it's key customers.

Qualifications and experience: Essential; At least 2 years experience of Data Transcript in AXE 10 environment preferabally CME20, or other proven testing/switching/support experience. Computer literate. Able to travel within the UK and overseas on occasion. Desirable; Higher technical qualification in telecom, radio or software related subject. Working knowledge of Ericsson procedures and experience in Data Transcript tools development.

Contacts: Mark Phillips, +44 1483 40 7375, mark.phillips@etl.ericsson.se or Gary Moore, +44 1483 30 5795, gary.moore@etl.ericsson.se.

THE FAST TRACK CENTRE IN SPAIN

Fast Track Solutions Engineer/Software Engineer

The Fast Track Centres perform system investigations and software design within the whole AXE System. We take part in the development from requirement analysis to FOA. Also we take part in the technical co-ordination and project planning. Market Units and Customer groups are our customers.

● We now need several designers/engineers with experience in multiple product areas like IN-SSF, TCS, CHS and ACC. The persons we are looking for shall have a customer-focused approach to the development of the total solution for our customers. This will mean contacts with a variety of people from marketing, project and product management both from the MU´s as well as the product areas.

Key working areas: Providing technical expertise to our customers to find an optimal solution technically and project wise. Perform Fast Track Quick Scans, Quick Studies, Technically assess potential product and make recommendations. Participate in pre-studies and feasibility and project execution. Also, actively contribute to the continuous improvement process and the development of the quality culture identifying and implementing improvements to processes and activities.

Our Web site is: http://alvaro.ericsson.se/tl/fasttrack/fasttrack.html

Contact: The Fast Track Centre in Spain, EEM, Luis Cardenas, +34 91 339 2154 or Lars Garneij, +34 91 339 3512.

ERICSSON ESPAÑA SA

Senior Project Manager

EEM/TD/M department at Ericsson España SA in Madrid, is thecompetence center for GSM and UMTS Databases. We are responsible for thefollowing products HLR, AUC, FNR, EIR and ILR, known under the common nameGDB.

Up until last year we have mainly worked with AXE10-development, but we arenow gradually moving over to open platform development (Windows NT and TelORB/Tango).

We are just starting up the execution phase for one of the most exciting projects ever,for Ericsson and for our organization, the R9/UMTS project. For this project we needan experienced project manager.

● As a project manager for the GDB R9/UMTS Main project you will be responsible for a project with4 design and function test subprojects (two in Spain, one in Greece and one in Sweden), of which 3 will work in AXE10and one in Windows NT. There will also be a TCM subproject and a system test subproject, which both will be located in Spain.

The Main project belongs to the CSS Core Network Total project, which will deliver the core network for both GSM and UMTS.

As a project manager you should be goal-oriented, be used to work in an international environment and have a number of yearsof experience as a project manager for big development projects.

If this sounds exciting and you feel like coming to the very nice and vivid city of Madrid then do not hesitate to apply for this job.

Contact: Project Office Mgr, EEM/TD/MP, Rickard Romander,+34,91339 1552, Rickard.Romander@ece.ericsson.se.

ERICSSON SYSTEMS EXPERTISE LTD, IRELAND

Open Systems I&V Personnel

A number of vacancies exist within the Wideband Radio Network I&V Grouplocated within the Radio Network Solutions Centre for I&V personnel to testproducts at Subsystem and System level.

We are developing and testing O&M applications for the W-CDMA radionetwork. Because our environment, processes, methods and tools are still being developed, successful candidates will need to be self-starters, proactive and high on initiative.

● Applicants should have competence in the following areas; At least 2 years experience of testing telecomms products. JAVA/CORBA competence. Good knowledge of complete software lifecycle. Knowledge of OOAD and UML (desirable).

If you have the commitment and the qualities to join our team and work in a leading edge project, contact us.

Contact: Maurice.ODonnell@eei.ericsson.se, +353 1 207 2743, ECN 830 2743.

ERICSSON LTD, UK

Revenue Accountant - NPN, Finance

● The Revenue Accountant covers the key areas of: Managing the processes regarding the validation and recognition of order intake and sales. Is also responsible for managing the invoicing process and ensuring that timely and accurate invoicing takes place in accordance with customer supply agreements. Manage the Novation order process whereby orders are transferred from NPN to Ericsson companies within Europe. Manage the commission process relating to these orders, and supervise related inter-company debt. Accounts receivable management, liase with FSU credit control manager to ensure that AR management is optimised.

The Revenue Accountant will also be heavily involved in the preparation of monthly management accounts, including Key and Global account financial reports. These are an essential part of the reporting process, and need to reflect internal customer needs, so as such, need to be timely, relevant and accurate.

Liaison with the Finance Shared Service Unit (SSU), other Finance groups and IS / IT departments are a key part of the role to ensure that we do not re-invent the wheel, and that we are able to lever resources and support from elsewhere within ETL, using common tools and approaches where practical.

Due to the small size of the NPN Finance team, the Revenue Accountant will be required to provide front line support in the absence of the Finance Manager, and will be required to support the Project Costing, area as required.

Key Responsibilities: Management of order intake and sales processes. Ensure customer invoicing takes place in a timely and accurate manner. Manage accounts receivable (external and inter-company). Weekly reporting of order, sales and AR position to NPN management. Prepare budgets, and estimates to agreed time-scales. Preparation of monthly management accounts. Preparation of monthly Global and Key account European financial reports. Act as interface to Finance SSU and IS / IT departments. Other reporting / support needs as necessary.

Qualifications, Experience and Knowledge: Essential, Part Qualified Accountant – CIMA. At least two year's experience with computerised accounting systems. Ability to work in a team environment and actively contribute to decision making. Good communication / presentational skills. Good inter-personal skills. Microsoft Office Skills - Strong Excel & Access, Word. At least two years experience in a financial discipline. Desirable: Knowledge of Ericsson and / or Telecoms industry.

Contact: John Ogden, Finance Manager, New Public Networks, +44 1483 30 5467, john.ogden@etl.ericsson.se.

BUSINESS UNIT TRANSMISSION SOLUTIONS, PU OPTICAL NETWORKS

IS BUSINESS MANAGER

The IS Business Manager provides strategy and direction on the provision of IT solutions within the Product Unit Optical Networks in Horsham, UK.

● The successful candidate will need to fully understand business requirements and translate these into optimal IS/IT solutions within budgetary and time constraints.

Main responsibilities will be: Managing the provision of efficient, effective and cost controlled IT support through external supply. Providing state of the art Intranet solutions as the organisation's communication backbone tool. Managing the integration of internal and external systems with specific reference to our key suppliers and Ericsson legacy systems.

Ensuring up to date working knowledge of latest developments in IT field (both internally and externally) in order to ensure the most appropriate techniques are implemented within the organisation. Define and implement education programs for all the PU's employees to enable the user to fully utilise provided IT infrastructure. Providing direction and support to the IT team.

Suitable candidates will have extensive experience of working with Microsoft products; good communication skills; a thorough understanding of the use of IT from a business perspective, having experienced managing and developing IT systems. You will be a strategic thinker, able to interpret business decisions and processes into an IT requirement.

Contac: Johan Mardh +44 1403 277423, johan.mardh@etl.ericsson.se or Human Resources, Llynor Rathbone, +44 1403 277557, llynor.rathbone@etl.ericsson.se, PU Optical Networks, Broadlands, Horsham, UK.

Support Engineer

● As part of our Global Support team you will be providing a first class support service to our customers around the world. The duties will include providing emergency and day to day support to our customers, by answering their queries, providing solutions and visiting sites both during and outside normal office hours.

Technical knowledge of SDH transport networks, fibre optics, data comms. and computer systems will be required to support networks/products, diagnose problems, communicate and investigate solutions with customers. The role includes interfacing with internal and external customers and will also require knowledge of third party supplier network products.

Ideally you will have 3 years industry experience, a proven track record of managing or maintaining transmission systems.

Qualifications / Experience: 3 years in the telecoms industry managing or maintaining transmission systems, 18 months – 2 years as a trainee support engineer or verification of transmission products, a Degree or equivalent in telecommunications, communications, electronics or computer science.

Skills / Competencies: SDH/Transmission Products, Windows & NT knowledge, LAN/WAN knowledge, driving licence.

Contact: Shavak Madon, +44 1403 277290, Shavak Madon@etl.ericsson.se or Human Resources, Llynor Rathbone, +44 1403 277557, llynor.rathbone@etl.ericsson.se, PU Optical Networks, Broadlands, Horsham, UK.

ERICSSON EUROLAB DEUTSCHLAND (EED), NÜRNBERG, GSM BTS DEVELOPMENT

Configuration Manager

● You will support the project managers in the milestone planning and checking. As an interface to our colleagues in Kista you will coordinate parts of our CM activities. You will prepare product revision informations (PRI) and do further works in our maintenance projects, handle our document database, give tool support (e. g. ClearCase).

Good knowledge of UNIX and a programming language (e. g. Perl), work experience as a CM is a plus, english is required. This position is on a permanent base. A 2 year expatriat contract would also be possible.

Contact: Arndt Pischke, +49 911 52177 183, arndt.pischke@ericsson.com

ERICSSON NV/SA, BRUXELLES, BELGIUM

BSS CME20 Trouble Shooter

The objective of the job is to provide technical support in one or more of the system nodes that are operational in the customer networks such as BSC, BSC/TRC, BTS.

● You will also play an active role in providing support and advice to the local engineers and build up the local competence. This requires close relationship and interaction with the customer, strong technical background that enables you to conduct fault analyses, trouble shooting and program correction handling in an efficient manner.

Requirements: You have experience of working within Customer Support, a good knowledge of support activities such as: Troubleshooting, writing Plex/ASA, APZ/IO recovery, trouble report handling (MSS or MHS) and system upgrades. You have good command of written and spoken English.

SS CME20 Trouble Shooter

The objective of the job is to provide technical support in one or more of the system nodes that are operational in the customer networks such as HLR, MSC/VLR, SCP, AUC/EIR.

● You will also play an active role in providing support and advice to the local engineers and build up the local competence. This requires close relationship and interaction with

the customer, strong technical background that enables you to conduct fault analyses, trouble shooting and program correction handling in an efficient manner.

Requirements: You have experience of working within Customer Support, a good knowledge of support activities such as: Troubleshooting, writing Plex/ASA, APZ/IO recovery, trouble report handling (MSS or MHS) and system upgrades.

You have good command of written and spoken English.

Account Manager UMTS

● The Account Manager contributes to the profit of EBR and Ericsson by accomplishing commercially sound deals with customers.

His aim is to achieve and maintain the highest level of customer confidence and satisfaction by serving the customers needs and ensuring high quality performance of all activities.

Key tasks include: develop and maintain an extensive, relevant customer contact network in order to identify and forecast customer requirements; prepare sales strategies and various incentives to be applied and given to customers; present and discuss concepts and solutions to customers and co-operate with the customer in order to finalise parameters; gather marketing intelligence information from various customers; treat the customer complaints and ensure resolution of all issues; manage the budgets.

The ideal candidate holds a University degree in technical, economical or administrative field or equivalent; has solid experience in Account Management, works independently, strategicaly and analytical.

Contact: Petra.Remans@ebr.ericsson.se, Petra Remans, Raketstraat 40, 1130 Brussel

ERICSSON RADIO SYSTEMS AB, LINKÖPING

Center for Wireless Internet Integration in Linköping is a department within Ericsson where we work with many exciting projects for the future. Our task is to combine the best of both worlds – mobile telephony and Internet technology – in order to create new, powerful products and services in wireless computer communication.

We work in a small and efficient organisation, with close access to the large company's resources. It gives us the possibility to always be on the cutting edge of technology in an everchanging world.

In the whole process, from vision, through development and production, to sales and support, we continually meet new challenges. Are you prepared to take these on – with new skills, enthusiasm and creativity?

The department will reinforce the verification unit for the User Service Center, USC. The test unit will have the main responsibilities to perform system verification of the USC products and have an active role within the USC design and customer support activities.

The unit will furthermore also be responsible for the different verification projects that reside within product area USC.

These projects perform in an international and intra-culture environment and are covering a vast range of development areas at the leading edge of technology within the area of Mobile Internet. To strengthen our positions we are looking for a

System Test Leader

● Your main authorities and task are to plan, coordinate and follow-up of System Integration and System Verification activities in the overall USC projects.

Furthermore you will also be the interface towards associated design, verification and support projects in project related matters and of course you will be the coach for the team.

As a suitable candidate you have good knowledge of datacom, are flexible, creative and have good communication and cooperation skills. Fluency in written and spoke English is required. You should also be familiar with System Test and previous managerial experience, e.g as Project Leader/ Test Leader is a clear advantage.

Contact: Mats Erlandsson, +46 13 32 21 47, mats.erlandsson@era.ericsson.se or Ann-Christin Forssell, Human Resources, +46 13 32 22 19, ann-christin.forssell@era.ericsson.se.
Application: Ericsson Radio Systems AB, Att: Anette Kindvall, Box 1885, 581 17, LINKÖPING, SWEDEN, anette.kindvall@era.ericsson.se.

THE GLOBAL RESPONSE CENTER, DALLAS, USA

AXE Senior Support Engineer

The Global Response Center plays a strategic and central role in Ericsson's global customer support. GRC is the escalation point for the local support organisation. Through the GRC, Ericsson's top technical expertise is made available worldwide.

Today, GRC supports all public Networks' products, tomorrow, GRC will be a part of an integrated support organisation for the whole Ericsson product portfolio.

● The Global Response Center in Dallas USA is currently looking for engineers with 4 or more years of AXE experience. One or more years in Emergency support would be desirable.

You should possess a broad knowledge of Ericsson's telecom and datacom solutions, be fluent in PLEX and ASA, have good troubleshooting skills and have a highly developed competence within one or several of the following areas

IN (SSF/SCF). Signalling protocols, e.g. ISUP4, ISUP5, IT-UP, QSIG. Access Protocols e.g. ISDN, ISDN-E, V5, DPNSS. Group Switch.

Contact: Bjorn Johansson, Operations Manager USGRC, Richardson, Texas, +1 972 583 1450 or Arturo Pabon, AXE team leader, +1 972 583 2120.

ERICSSON TELECOM AB, NACKA STRAND

IP Networks Access, TTM Operations is looking for engineers on short-term service in Santa Barbara, California.

ICT Test Engineer

● You will develop testable PCBs, and work with CMs to implement superior test processes. You will be responsible for all phases of PCB assembly test, design through product life. BSEE or equivalent with 2+ years ITC exp. Contractors welcomes.

Process Engineer

● You will work with design engineers to develop manufacturable PCB assemblies. Work with CMs to implement superior assembly processes. Responsible for all phases of PCB assembly, design through product life.

BSEE or equivalent with 2+ years PCB exp. Contractors welcome.

Diagnostic Test Engineer

● Here is your opportunity to develop test tools and processes. Work with CM to implement superior test processes. Responsible for all phases functional test, design through product life.

When forwarding your application by E-mail, please send a copy to Larry, EUDLAFO@am1.ericsson.se.

Contact: Director Larry Foshee, +1 805 9610646, EUDLAFO@am1.ericsson.se, Birgitta Vinje, Human Resources, +46 8 422 0230.
Application: Engineers, Santa Barbara, Ericsson Telecom AB, NA/ETX/D/H Siw-Britt Johansson, 131 89 STOCKHOLM, siw-britt.johansson@etx.ericsson.se.

ERICSSON RADIO SYSTEMS AB, KISTA

Director Product Marketing, Brasil

The Brazilian market continues its strong growth were Ericsson's 15 customers are very active increasing their market share from today's 40%.

● You will be accountable for Product Marketing, driving the sales of the whole Ericsson Product Portfolio for Wireless Systems through the 7 KAM teams and 1 NAM team, interfacing with the supporting BU/PU functions around the globe.

Leading a group of some 60 people, you will be continuously building competence to ensure a leading position for EDB in The New Telecoms World.

You will also be the local sponsor for the Mobile Internet Institute, our new initiative for development and integration of packet data applications.

We expect you to have solid managerial experience and have documented success in previous international assignments. You are a dedicated Competence Builder with a clear people focus and good networking skills, willingly sharing your extensive Ericsson network, your knowledge and your ideas.

Furthermore, you are a doer with a practical approach, able to make things happen. In order to increase sales and make our products profitable, you must have a true Business Focus and a broad knowledge of infocom. You have at least an M.Sc. or equivalent, and you either speak Portuguese, or have a natural ability for learning languages.

Contact: Lars Birging, +46 8 58531625, lars.birging@era.ericsson.se, Bo Ribbing, +46 8 757 0575, bo.ribbing@era.ericsson.se, Lars Jerhlander, +55 11 6224 0007, lars.jehrlander@edb.ericsson.se.
Application: Director Product Marketing, Brasil, Ericsson Radio Systems AB, ERA/AH/LC, 164 80 Kista, catrin.dysing@era.ericsson.se.

ERICSSON RADIO SYSTEMS AB, SUNDBYBERG

MARHABA GSM IN SAUDI AND MEA

Ericsson is preparing to roll out an expansion of the GSM (900/1800) network in Saudi Arabia. The final decision will be taken before the end of January.

The planning is based on a complete turnkey solution, from site acquisition to operation & maintenance.

For Saudi and other rapidly expanding operations in the Middle East & Africa, we require the following managers:

Key Account Manager
Finance Manager
Technical Manager
Operations Manager
Sub-project Managers
Design Managers
Logistics Manager
Site acquisition & Civil works Managers
Installation Managers
Integration Managers
FSC Manager
NOM Managers
HR-manager

● Basic Requirements for all positions: long experience as a manager in the GSM environment, as well as international experience. You should also have power of initiative, high motivation and a good ability to co-operate.

Contact: Hans Olander, Business Manager Key Accounts, +46 8 4046942, hans.olander@era.ericsson.se, Lars Birkstedt, Business Manager New Accounts, +46 8 4042045, lars.birkstedt@era.ericsson.se, Håkan Nordlander, Operations, +46 8 58534810, hakan.nordlander@era.ericsson.se.

Project Planner
Site acquisition & Civil works supervisors/experts
MSC & BSC testers
Integration engineers
SS Support engineers
BSS Support engineers
NOM engineers

● Basic Requirements for all positions: long experience of AXE and GSM environment, as well as international experience.

You should also have power of initiative, high motivation and a good ability to co-operate.

Contact: Hans Olander, Business Manager Key Accounts, +46 8 4046942, hans.olander@era.ericsson.se, Måns Fajerson, Operations, +46 8 58532896, mans.fajerson@era.ericsson.se, Anita Malmström Wallner, Human Resources ERA/LP/H, +46 8 4042429, anita.malmstrom-wallner@era.ericsson.se.
Application: MARHABA GSM IN SAUDI AND MEA, Ericsson Radio Systems AB, SG/ERA/LP/HA Pirjo Hautala, 164 80 STOCKHOLM, pirjo.hautala@era.ericsson.se.

ERICSSON KOREA LTD, KOREA

Ericsson Korea Ltd, Korea is one of the big mobile markets today with 22 million subscribers (48%) and a rapid growing Internet usage (6 million Nov 99).

The interest for 3G solutions is great and the licenses will be released during 2000. Commercial services will start in the first half of 2002 in order to serve at the World Cup Football that is shared with Japan.

At Ericsson Korea we are 80 persons representing all products in the Ericsson portfolio with well established business within wireline systems and entering the business areas for IP and WAP products.

We are now building a WCDMA organization to penetrate this promising market and need to strengthen our team with a Technical Manager WCDMA and a Senior Engineer-Radio Network Design WCDMA Systems:

Senior Technical Manager WCDMA

● You will be part of an Account Team working towards an operator. The Technical Manager (TM) has the responsibility towards performing all tasks related to technical co-ordination, product management, network design, sales support and system services support for the customer.

We are looking for a person with a solid technical education and thorough experience as a technical manager in GSM/WCDMA mobile telephony.

You can work independently, you take initiatives and you communicate well with others. You are used to work at a high speed and make your decisions quickly. You must have a commercial understanding and you must be a good representative of the company.

Good knowledge of spoken and written English is mandatory.

Senior Engineer- Radio Network, Design WCDMA Systems

● You will be part of the Solutions & Engineering Team and support our Account Teams in their customer activities. Your main responsibilities are to: formulate radio solutions meeting customer requirements. conduct technical presentations. prepare radio network design proposals. to interface with the customer on radio network related issues.

You are working as a RND, preferably within GSM/WCDMA systems, and are now ready to work on a demanding 3G market. You can work independently, you take initiatives and you communicate well with others. You are used to work at a high speed and make your decisions quickly. You must have a commercial understanding and you must be a good representative of the company. Good knowledge of spoken and written English is mandatory.

Contact: Lars Bjorck, lars.bjorck@ekk.ericsson.se. Application: Sunny Hwang, sunny.hwang@ekk.ericsson.se

MU CARRIBEAN

Director New Accounts

Market Unit Caribbean covers an area of 15 countries and 15 dependencies with some 27 million people. The telecom markets in the area is in the process of deregulation with a number of possibilities within mainly cellular and datacom networks.

We are now looking for an experienced marketer who as a leader for the NAM group can further develop New Accounts within this MU. The position is located in San Juan, Puerto Rico but frequent travel in the Caribbean is required.

● Candidate should have a M.Sc or MBA degree and broad professional experience of international sales & marketing of TDMA, CDMA and/or GSM with a successful track record. You should have previous experience as a leader as well. Broad knowledge of 3G Mobile technology and Ericsson's datacom solutions is a merit. As for your personality, we expect you to have a drive for result and excellent interpersonal skills.

As the area is multicultural, fluency in English is essential and knowledge in Spanish / French is a further merit.

We expect the successful candidate to start during May 2000.

Contact: Peter Lindberg, Director New Accounts, +1 787 771 1700.

Field Support Center Manager

Market Unit Caribbean is looking for an FSC Manager that will provide 1st line support to customers throughout the Ericsson Caribbean MU. The position is located in San Juan, Puerto Rico but frequent travel to Grand Cayman, Jamaica, and Curacao is required. Periodic travel to the USA is ocassionally required.

● Candidate must be able to investigate, advise on and produce solutions to TDMA/GSM problems experienced by Ericsson Caribbean customers. The position has frequent contacts with Ericsson national and international support organizations as well as external customers and vendors. Establish and maintain a budget for each customer support contract as well as for the FSC Department. Maintain a current training level for all assigned FSC Engineers.

FSC Manager is additionally responsible for managing the IS/IT Deparment. This entails managing personnel in providing IS/IT support to the offices within MU Caribbean. Experience from the system support field is highly desirable. Only Ericsson employees will be considered for this position. Fluency in English is essential and Spanish is appreciated.

We expect the successful candidate to start June 1, 2000. The duration of the assignment is 2 years.

Contact: Jerry Barrera, Director FSC, Arne Palmkvist, Director Operations, +1 787 771 1700.
Application: Noelia Borrego, HR Representative, noelia.borrego@ericsson.com.

ERICSSON RADIO SYSTEMS AB, SUNDBYBERG

Technical Manager to Romania

Do you wish to become a member of a successful team to pursue our GSM break-through in Romania? Romania of today is an exciting country, now turning towards the West. This is certainly the case when it comes to GSM, which was introduced in 1997. It was a flying start, which surpassed all expectations and during this summer we signed a contract with the third operator, CosmoRom, dominated by the Greek operator OTE.

● The GSM 1800 system is presently being delivered, and we need an experienced technical manager to take the technical responsibility during the implementation and capable to support the aggressive further network developing plan. The tempo is high and the customer is in a tough competitive situation, and by offering excellent support, we want to contribute to help CosmoRom obtaining a strong market position in Romania.

You will become a member of a Total Project Management team, in which your role is to have the technical responsibility for the system. You will also participate in the sales activities towards the customer. You will have direct contacts with the customer, which is stimulating and challenging, but also demanding.

We are looking for a person with a solid technical education and thorough experience as a technical manager in GSM mobile telephony. It is valuable if you have experiences from working with new products as IN and DATACOM. You can work independently, you take initiatives and you communicate well with others. You are used to working at a high speed and make your decisions quickly. You must have a commercial understanding and you must be a good representative of the company. Good knowledge of spoken and written English is mandatory. If you are the right person, this position gives good opportunities for a continued exiting career.

Contact: Mikael Anckers, +46 8 757 39 68, mikael.anckers@era.ericsson.se, Anita Malmström Wallner, Human Resources, +46 8 404 2429, anita.malmstrom-wallner@era.ericsson.se.
Application: Technical Manager to Romania, Ericsson Radio Systems AB, SG/ERA/LP/HA Pirjo Hautala, 164 80 STOCKHOLM, pirjo.hautala@era.ericsson.se.

ERICSSON TELECOMUNICAÇÕES LDA. LISBON/PORTUGAL

IN Design Engineers

Ericsson Telecomunicacoes Lda in Portugal is looking for IN Design engineers to join our VAS Design Centre, within the Customer Services Division, based in Lisbon. We offer you a long term assignemt in a warm and nice country. Ericsson in Portugal is supplier of all three GSM operators and some of the new major Wireline operators.

● Main responsibilities: Participation in the IN Design processes for development of new IN services and customisations of standard services. These processes are: analysis, design, implementation, testing and maintenance. A very important role is to transfer competence to the local staff.

Requirements: At least 2 years experience in any of the design processes referred above, more specifically candidates shall have good knowledge in any of the following areas: SCP design, SDP design for PPS or PPA services, GSA design, system design, system integration, IN design project management. The candidate shall have good english and communication skills.

BSS System Support Engineer

Ericsson Telecomunicacoes Lda in Portugal is looking for a BSS system support engineer to join the BSS support team in our Customer Services Division, based in Lisbon. We offer you a long term assignement in a warm and nice country. Ericsson in Portugal is supplier of BSS equipment for all three GSM operators. Our support organisation is established since 1992.

● Main responsibilities: You have to be involved in all main FSC customer support processes: CSR Handling (TR and Consultation), Emergency service, SW update/upgrade. A very important role is to transfer competence to the local staff.

Requirements: At least 4 years technical experience working with GSM BSS system, preferably with system support. Good system knowledge and SW troubleshooting skills. Knowledge of support processes and tools. Good english and communication skills. Experience with OSS applications and remote loading techniques are appreciated.

Application: Carlos Ferreira, carlos.ferreira@sep.ericsson.se, +351 214 466 194 or Luiz Ofner, luiz.ofner@sep.ericsson.se, + 351 214466288, Ericsson Telecomunicaçoes, Lda. Edificio Infante D. Henrique, Quinta da Fonte - Porto Salvo, 2780, 730 Paço de Arcos, PORTUGAL.

TELEFONAKTIEBOLAGET LM ERICSSON, TECHNICAL OFFICE SYRIA BRANCH.

MSC/BSS Support Engineers

We are looking for experienced MSC and BSS Troubleshooter to work in the Technical Support Department in Syria.

● The successful candidates shall be the main technical expert for resolving complex problems, and shall bewilling to transfer knowledge to the local engineers. Requirements: Must have at least 4 years experience from a support environment out of which 2 years GSM. Candidates need to have excellent SW/HW troubleshooting in live sites. Experience with MHS/ ACH/ C7/ ISDN/ PLEX/ ASA.

Contact: John Robehmed, Technical Support Manager, +963 11 613 3028, fax: +963 11 611 3138, eusjro@am1.ericsson.sejohn_rob@hotmail.com

ERICSSON S.A. SPAIN

The Core Applications unit within Ericsson's R&D Center in Madrid selects

Systems Engineer - Standardisation

● to work in standardisation duties (ETSI, ITU) in the area of network signalling systems(SS No. 7 - MTP, SCCP, TCAP)

The job is carried out by active participation in the working groups and plenaries, as wellas participating in an international standardisation network (preparation and analysis of contributions, support to affected projects, support to market/customer units)

Requisites are: good command of English, team work skills, availability to travel, analytical skills, as well as a good knowledge of signalling system SS No. 7 through 3-4 years experience in design, testing or systems development. Having a good international contact network, self-directing, negotiation skills and initiative will be valued.

2 Systems Engineers - Network Signalling

● to work in OPM tasks for signalling system SS No.7: customer and market support, expert support to projects, product responsibility, technical committees, quickstudies, system investigations, prestudy and feasibility phases. The work is carried outas part of an international systems management network, with contacts to a numberof design and customer organisations.

Requisites are: good command of English, team work skills, initiative and self-directiveness. A very good knowledge of SS No. 7 is required, achieved through at least 3-4 years experiencein design or testing, preferably in AXE environment.

Contact: Isidoro Garzon, +34 91 339 2133

Product Manager - Signalling

● to work in the area of products for SS No. 7, in AXE platform as well as inothers (WPP, Solaris, etc). The work is carried out as part of a product managementteam within CAPC, as well as in strong cooperation with Ericsson Infotech AB, and includes: business opportunity tracing, business management support, support to externaland internal customers, preparing product plans, preparing requirement specs. And assignment specs. project tracking etc.

Requisites are: good command of English, team work skills, initiative and self-directiveness, availability to travel, as well as good knowledge of SS No. 7, achieved through at least 2 years experiencein the system. Having a good international contact network, as well as negotiation skills and experience in open platforms will be positively valued.

Contact: Jesus Tomas, +34 91 339 2896

2 Systems Engineers - Open Systems Architecture

● to work preferably in the area of products for SS No. 7, in open platforms (WPP, Solaris etc). The work iscarried out as part of a systems management team within CAPC, as well as in strong cooperationwith Ericsson Infotech AB, and includes: specification of platforms and SW architectures, productmanagement support, prestudy and feasibility phases, technical coordination and expert support in projects, etc.

Requisites are: good command of English, team work skills, initiative and self-directiveness, availability to travel. A good knowledge of SW architectures in open platforms is required, achieved through at least 2-3 years experience in design and testing, as well asknowledge in signalling system SS No. 7.

2 Systems Engineers - Fast Track

● to work in the area of market and customer solutions (Fast Track Service Center)in the phases of pre-prestudy and prestudy, providing solutions and alternatives in one or several subsystems and products, coordinating the activities that each affected unit (outside EEM) must perform, and monitoring the projects, providing the needed expert support.

Requisites are: good command of English, initiative and self-directiveness. A very good knowledge of the AXE platform and its SW architecture and components is required, achieved through at least 4-5 years experience in design andtesting in AXE. Experience and knowledge of a number of subsystems in AXE will be positively valued, especially in the areas of Access, IN and Charging.

Systems Engineer - System Characteristics & ISP

● to work in the area of System Characteristics and In-Service-Performance (ISP), doing characteristics studies for released products, recommendations on improvements of characteristics, analysis of HW and SW architectures, evaluation of methods and tools, preparation of requirements, etc.

Requisites are: good command of English, initiative and self-directiveness. A good knowledge of the AXE platform and its SW architecture and components is required, achieved through at least 3-4 years experience in design and testing in AXE. Experience and knowledge of a number of subsystems in AXE, and itsHW platform, will be positively valued.

Contact: Roberto Encinas, +34 91 339 2176.

ERICSSON EUROLAB, AACHEN, GERMANY

Software Design Engineers

Proj.No 07E00

Are you looking for a demanding and challenging career in Software Design? Can you respond well to significant challenges and responsibilities? Then you should finish reading

this ad. At EED/X/P we are responsible for the Software design, development and testof Mobile Switching Subsystems (MSS) within the GSM and UMTS standard.

● In this position you will have the opportunity to increase your knowledge of theUMTS functionality. You will work in an international organization as a member of a highly motivated team.

Requirements: Complete Telecom system knowledge. Programming experiencee.g. (C++, C) and a working knowledge of structural design methods is required for this position. Experience in SDL is a plus. A minimum of 2 to 4 years Software Design experience is recommended.

Contact: Gina Roge, EED/X/P, +49 2407 575 254, eedgina@eed.ericsson.se or Simon Seebass, Human Resources, +49 2407 575 163, eedsims@eed.ericsson.se.

The Test and Support Department (EED/X/S) within our CSS System House will in the future be responsible for system test, industrialization and support of UMTS Core Network as well as CME20 SS Product line at EED.

It includes CME20 Switching System /UMTS MSC Server releases, as well as product line maintenance and customer support for the CME20 SS /UMTS MSC Server product line.

The section responsible for the Product Line Maintenance activities, EED/X/SL is looking for a

Project Leader Product Line Maintenance for UMTS R1.0 / CME20 SS R9 04M00

● The project leader will be responsible for the Feasibility Study and Execution of the product line maintenance setup for UMTS R1 .0 (MSC Server) /CME20 SS R9.

He/she will report to the PLM section manager and to the CSS Support Project Office and work closely together with the R9 Indus and R9 Product Introduction Projects.

The main target is to define and implement a maintenance strategy using existing PLM infrastructure and identifying new needs to give the UMTS MSC Server maintenance a successful and future proof start.

For this position we expect a leader personality with a strong background in maintenance, preferably in the GSM area.

Additional background in Datacom is an advantage. He/she should be flexible, team integrating and be able to work under high pressure and customer expectations.

Contact: Elke Busch, EED/X/SLC, +49 2407 575 357, Eedelb@eed.ericsson.se or Simon Seebass, Human Resources, +49 2407 575 163, eedsims@eed.ericsson.se.

The EED/X/SG section within CSS system house is responsible for Verification and Maintenance of the Ericsson Global Packet Radio System.

We host projects for node and network verification prior to system release and take care of GSN node and network maintenance after worldwide availability.

Our vision is to take responsibility in network verification of mobile datacom networks. In order to strengthen this network competence we are looking for a

BSS Test Expert

● For this position we are looking for a skilled technical person with at least 3 years Ericsson experience in the verification or maintenance of GSM BSS nodes.

You will be working in a BSS core team providing the competence to drive our datacom verification activities to success. Activities in GPRS Network level Testing. Interface verification.

Integration of BSS. Trouble shooting on BSS with focus on the packet switching part. Supporting integration of mobile terminals into the network

As an ideal candidate you have worked with verification or maintenance of the BSC. Your sound knowledge of the BSS system enables you to work independently.

You understand the basic elements of the GPRS network and you are willing to expand your competence area with mobile datacommunication.

You have experience to share your knowledge with new colleagues. Change is normal to you on your way to identify solutions.

Contact: Maintenance & Customer Support, EED/X/SGC, Thomas Busch, +49 2407 575 178, eedthb@eed.ericsson.se or Simon Seebass, HR, +49 2407 575 163.

Manager Transit/ Traffic Control

The Transit Development Department in EED is looking for a Project Manager taking care of subprojects for Transit and Traffic Control development in the Application Core (CAPC).

The new Transit-AM (TRAM) and the included Wireless Traffic Control products are part of the mobile product lines UMTS, GSM, TDMA and PDC. The CAPC and Transit responsibility is located in EED/U at Aachen, Germany.

● The general responsibility of the project manager is to manage Transit and Traffic Control development projects from TG0 until MS8 as part of the EED/U/T project office team.

The main authorities and tasks are: To act as project leader in Transit and Traffic Control subprojects. To represent Transit/TCS projects towards CAPC main projects. To coordinate Transit/TCS projects towards the mobile applications (UMTS, GSM, TDMA, CDMA, PDC).

To actively take part in the resource planning process. To participate in improvement of project management methodology.

As a suitable candidate, you are an Ericsson employee and should have a minimum of 3 years AXE-10 development experience and good background in project management according to PROPS and Incremental Design.

Any managerial experience (e.g. as group manager, team leader or project manager) or experience in the transit and/or traffic control area is a clear advantage.

The position requires initiative, good communication skills and a good ability to work under pressure. Fluency in written and spoken English is required.

Contact: Transit Development Department, Norbert Floeren, Norbert.Floeren@eed.ericsson.se, +49 2407 575 228 or Simon Seebass, HR, +49 2407 575 163.

The CSS/GSM Operations has the overall responsibility for the Circuit Switching System (CSS) in all GSM based applications. This covers all classical GSM implementations on all frequency bands. In addition CSS will play a key role in introducing the 3rd generation systems, UMTS, on the world market. The Project Office & Development Operations Group EED/ X/R within the System House CSS/GSM is looking for an

Assistant Project Manager for the UMTS 2.0 / GSM R9 MSC/VLR Project

● The main challenges in the UMTS 2.0 / GSM R9 project are to design a new network and node architecture (split into Server and MediaGateways), to bring the UMTS core network project to a commercial release and to design complex GSM features.

As assistant project manager in the MSC/VLR project (CME20, 1/APT), your primary task will be to set-up and coordinate the planning activities for the GSM R9.0 MSC/VLR release, combined with the UMTS 2.0 features, in parallel to the ongoing UMTS 1.0 MSC/VLR project.

You will be working closely together with the project management team established for the UMTS 1.0 MSC/VLR release, as well as with the CSS total project in UMTS 2.0 / GSM R9 issues.

The main tasks and objectives during the first half of 2000 will be: Coordinate UMTS 2.0 / GSM R9 needs with the UMTS 1.0 project part. Ensure fulfilment of the project goals. Support and steer the UMTS 2.0 / R9 Feasibility Study teams. Planning of the UMTS 2.0 / R9 execution phase. Follow up progress, time, costs and quality. Interface to the total project and the MSC reference group. Represent MSC/VLR in the CSS R9.0 Change Control Board.

As a project manager you will need strong initiative, good planning, co-ordination and communication skills and the nature to never give up.

Contact: Human Resources, Simon Seebass, simon.seebass@eed.ericsson.se.

No. 2
February 17
2000

contact

Ericsson, HF/LME/DI,
Room 811023,
S-126 25 Stockholm

An orange tie or a bright green scarf. For a long time, exhibition uniforms have matched the color scheme of the Ericsson stand and some people have been quite reluctant to wear them. However, a new approach is being taken at this year's CeBIT exhibition. The clothes will reflect Ericsson's personality and image. Professionalism and quality are the guiding principles.

Professional and trendy image

People don't choose clothes according to the wallpaper they have at home, or the color of their sofa – people dress in order to be perceived in a particular way," explains Gunilla Solheim, who has selected Ericsson's new exhibition clothing.

Clothes from Filippa K

"The intention is that Ericsson's image and trademark be reflected in the clothes. That is why we selected Oskar Jacobsson and Stenströms, two quality Swedish labels, which are the fashion world's equivalent of Ericsson in the telecom industry," explains Henrik Mattsson, fashion consultant at BLOC Framtidsforskning AB, which has been hired by Ericsson.

Added to this are clothes from Filippa K, which will be worn by some of the younger exhibition staff at the Consumer Products stand at CeBIT.

"Filippa K is trendy, youthful and represents good Swedish design and quality," says Gunilla Solheim.

Dress to reflect the company

The selection of labels and designs in the collection enable the clothing to be varied depending on age and style.

To a certain extent, each person can select the combination that he or she finds professional and which feels right.

The new collection will be used at a series of upcoming exhibitions and events, although a sneak preview was provided at the GSM exhibition in Cannes recently. Unlike previous exhibition clothing, this collection will be used by all business segments throughout the company.

"It's important that our clothing does not give messages that differ according to the business segment or market we work in," says Gunilla Solheim.

"Ericsson has one trademark and our clothing is designed to reflect that."

Mia Widell Örnung
mia.widell@lme.ericsson.se

Many people want to appear colorful and trendy at exhibitions. This is Alcatel's personnel in their exhibition clothing at the GSM exhibition in Cannes.

The new exhibition collection, which is designed to be professional and strictly business-like, focuses on Ericsson's image. Although the color scheme is gray, which some may find dull, this color represents both professionalism and trendiness, according to Gunilla Solheim and Henrik Mattsson, the creators of Ericsson's new exhibition collection. Photos: Lars Åström

UPCOMING

February 16–19: Major management meeting in Hong Kong, to which Kurt Hellström, Ericsson's President, has invited more than 300 of Ericsson's top executives. This meeting is to become an annual event. Contact will be there.

February 24–March 1: CeBIT. The major telecom and IT exhibition in Hanover, Germany. Like its industry competitors, Ericsson will be demonstrating its might. Contact will be bringing extensive reports from the exhibition.

UPDATES

January 28: Ericsson presented its year-end figures for 1999. The fourth quarter was the best to date in the history of the company. Full-year earnings of SEK 16.4 billion were somewhat lower than in 1998.

January 28: Jan Wäreby succeeded Johan Siberg as head of the Consumer Products segment. The Europe, Africa and Middle East market area, for which Jan Wäreby is currently responsible, is being divided into Western Europe in one section, and Eastern Europe, Africa and the Middle East in the other. Ragnar Bäck will be responsible for Western Europe.

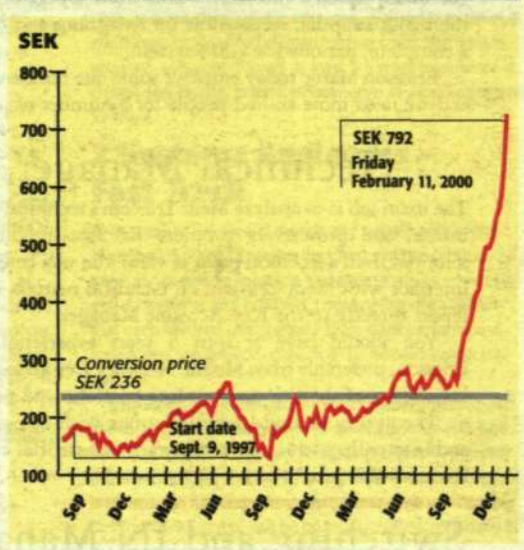
March 3: Record order from Turkey. Ericsson's largest mobile system order to date was presented. Worth USD 850 M, approximately SEK 7 billion, it is for the build-out of Turkey's GSM network.

NEW ASSIGNMENTS

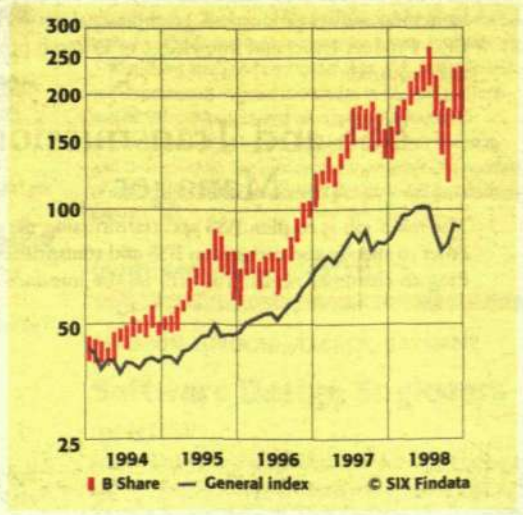
Kristian Tear has been appointed head of Ericsson in Switzerland. He succeeds Werner Kreiss, who will remain the company's chairman. Kristian currently heads Ericsson's market unit in Central America.

Christer Ek has been working on the development of a distribution chain for UMTS, the 3G mobile system, since January 1. He will work within the Supply & IT corporate function, but report to Mats Köhlmark, who is head of the WCDMA unit.

THE ERICSSON B SHARE



An Extraordinary General Meeting of shareholders on September 9, 1997, approved a proposed convertible debenture program. The conversion period extends through May 30, 2003. For additional information, access the web site: http://inside.ericsson.se/convertibles



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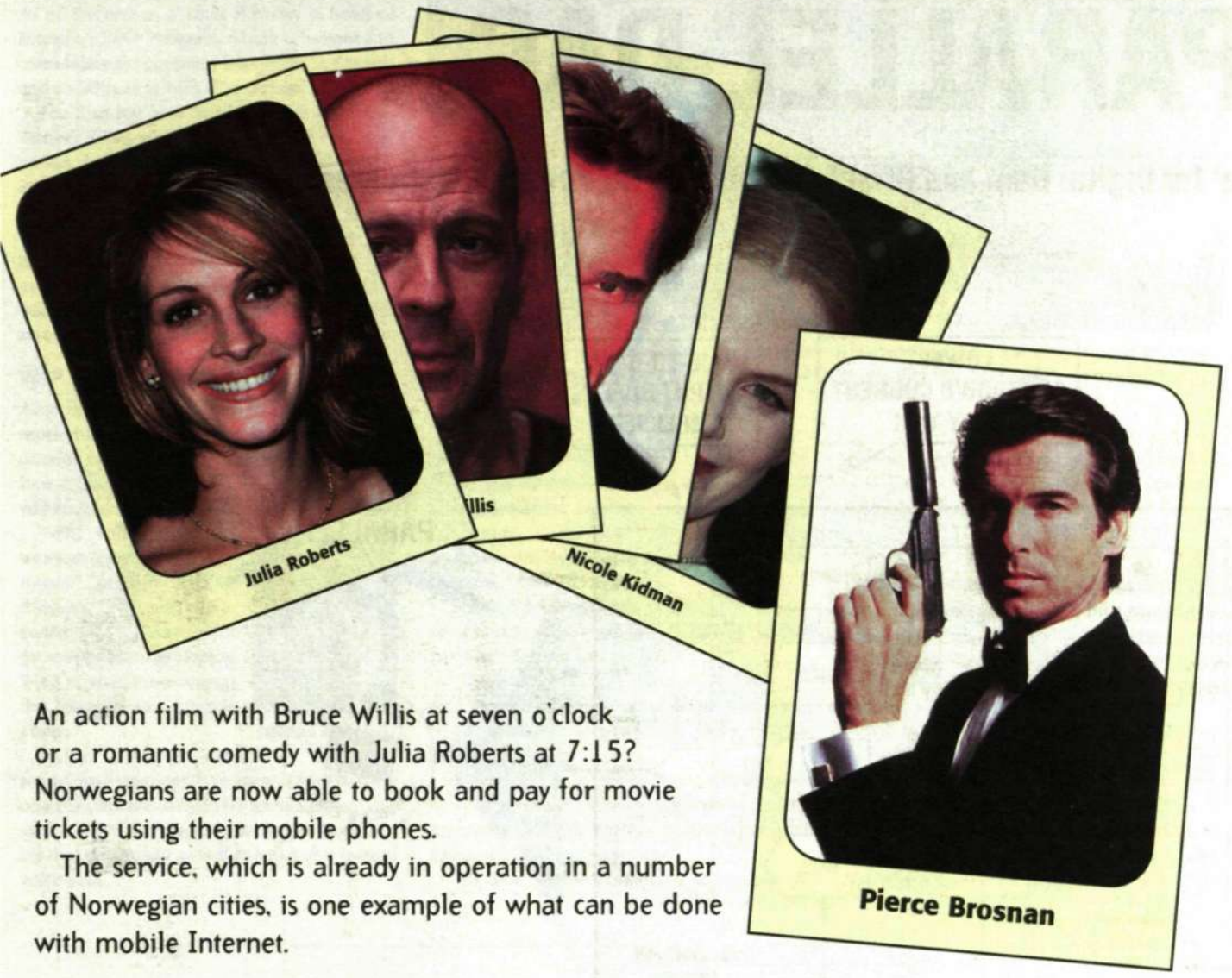
FEBRUARY 2000



An action film with Bruce Willis at seven o'clock or a romantic comedy with Julia Roberts at 7:15? Norwegians are now able to book and pay for movie tickets using their mobile phones.

The service, which is already in operation in a number of Norwegian cities, is one example of what can be done with mobile Internet.

Photo: Pressens bild

Pay for movies by phone

Sitting on the chairlift on their way up the ski hill, Kari and Geir decide they want to see a movie in the evening. Instead of buying a newspaper to look up movie times, they pull out their mobile phone and retrieve information about which films are showing where and at what time. Everything they need is there. If they don't find a movie they would like to see, they can choose to continue skiing a little longer instead. And the call only cost them NOK 3.

If they decide to go see the James Bond movie playing at Kino 1, they can book their tickets directly over the phone, deciding themselves which seats they want. They're also able to pay for the tickets, either using a debit or credit card, or with the help of a mobile account that transfers funds from a bank account.

To confirm that they've paid for the tickets, they receive a numerical code via SMS. Now all they need to do is pick up the tickets, and since they've already paid for them, they don't need to show up at least 45 minutes before the film starts to pick them up. Instead, Geir and Kari can keep skiing as long as possible and avoid having to rush off to the movie theater to buy tickets. Altogether, they pay a total of NOK 8 for the service.

MOBILE MOVIE PURCHASES

The service can be accessed from any of several GSM telephones. Ericsson models that can be used include the T18, T10, T26, R320 and A1018s.

Nokia, Motorola, Alcatel, Bosch, Philips, Siemens and Panasonic also have models that work with the mobile commerce SIM card.

Collaborative effort

Ericsson is working on several fronts to develop content for the mobile Internet. Contact has previously reported on a WAP collaboration with Reuters to deliver financial news in a similar manner.

The movie theater service is the result of collaboration between Ericsson and Norwegian GSM operator Telenor Mobil.

In order for this kind of service to work, participation is required from several players, including movie distributors. In this case, Filmweb posts the movie theater information on a website. Mobile phones requesting the service are linked through this site.

The system was first tested in Bodø in June of last year. By November, residents in six other Norwegian cities were given the opportunity to use the service. Plans are now underway to launch the system in Oslo sometime this spring or early summer.

"From a technical standpoint, the service works very well," says Knut Oppegaard, product manager at Telenor Mobil. "So far, a few hundred people have purchased tickets in this manner, but we expect that the number will be on the order of hundreds of thousands in the future."

Knut Oppegaard compares the effort to that of the chicken and the egg. Many services are guaranteed to attract customers, while a large customer base attracts many suppliers.

"This type of service will become extremely important in the market of the future, and for us it is essential that we're involved early on," says Knut Oppegaard. "We also have a steady stream of new customers."

No special equipment

Customers do not need any special equipment to access the service, which works with a number of GSM phones. What is needed is a subscription to Telenor Mobil's mobile commerce service, MobilHandel. Customers register using either a bank account or credit card and then receive a new SIM card. Once the card is installed, the mobile commerce function appears on the phone menu and includes items such as the movie theater service.

Maria Paues
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INTERNET

Mitch Maddox, or DotComGuy as he is now called, is being sponsored to stay in his apartment for an entire year. He aims to prove that everything he needs can be acquired over the Internet.

Self-imprisoned DotComGuy lives by net purchasing

➤ While Ericsson and other companies are working to make e-commerce simpler and more secure, there are those who have been devoting themselves to e-commerce for years.

Mitch Maddox is the guy who wants to prove that you can already buy everything you need over the Internet. First he changed his name – then he locked himself in. For all of the year 2000, he will remain isolated in a three-room apartment in Dallas, Texas in the U.S. When DotComGuy, as he is now called, moved in on January 1, the apartment was empty except for a stove, refrigerator and computer.

A month has now passed and he has already acquired a telephone, an exercise machine and several other items.

Everything he eats or drinks is ordered via the Internet.

The apartment is monitored by a number of webcams and sponsors of the experiment pay DotComGuy a salary that doubles every month. For January, he is only being paid about SEK 200, but if he makes it through the entire year, he will earn a total of approximately SEK 850,000.

Already, DotComGuy is attracting tens of thousands of visitors to his website every day. On it, those who are interested can see live images of him and read his journal.

"My friends think I'm crazy. And perhaps I am," writes DotComGuy. "But I know that e-commerce scares many people and I want to change that by showing its advantages and disadvantages."

He does not think that he will get lonely. "With the Internet, there's no need for people to go without friends."

DotComGuy is allowed to receive visitors, but he is not allowed to leave the apartment unless he or someone close to him becomes seriously ill.

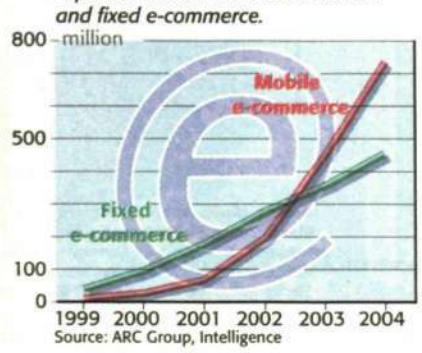
The experiment will conclude on January 1, 2001.

www.dotcomguy.com

DID YOU KNOW THAT...

the future speaks for mobile e-commerce to accelerate in 2001, Ericcson believes.

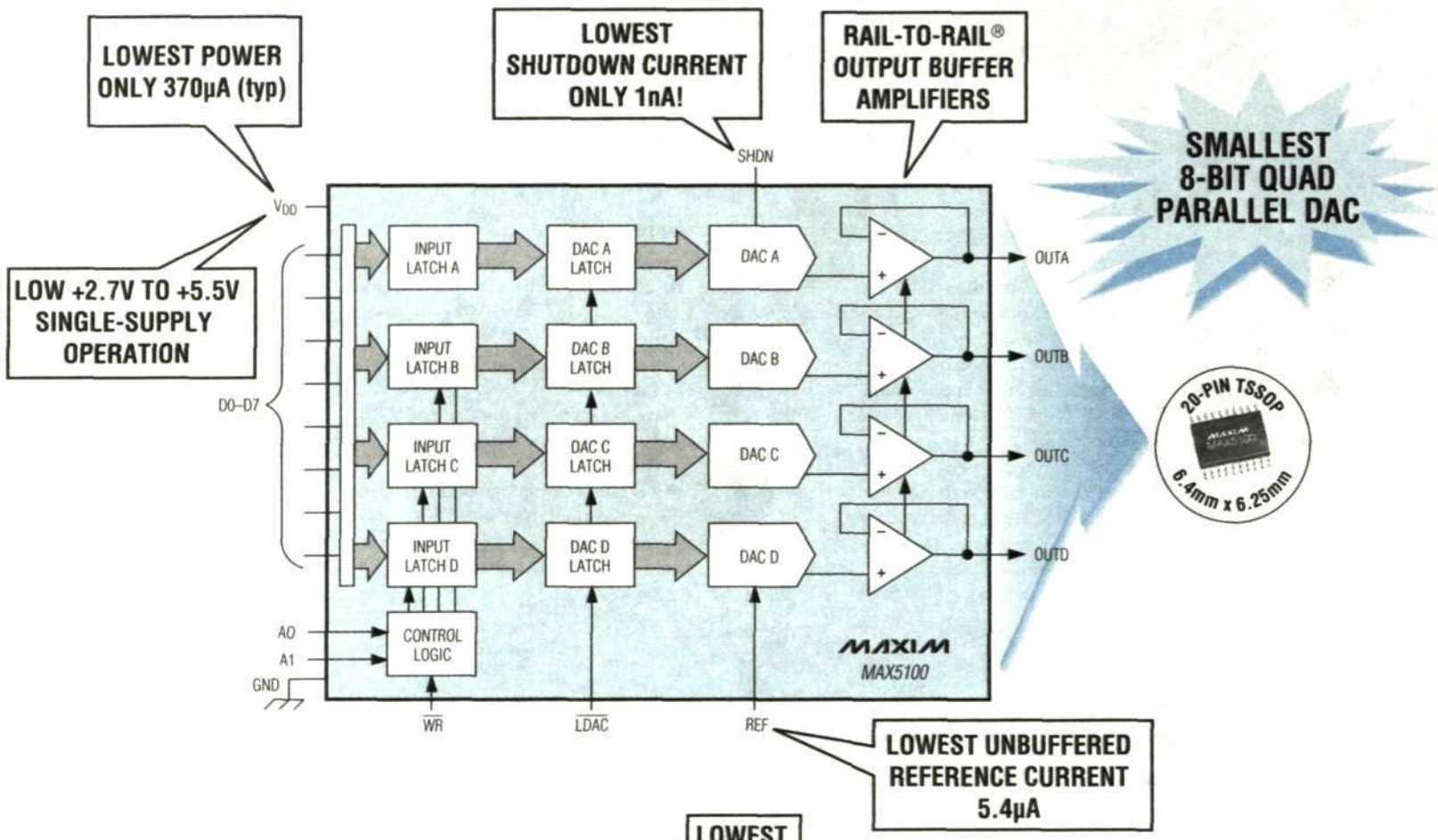
Expected number of users of mobile and fixed e-commerce.



Source: ARC Group, Intelligence

WORLD'S LOWEST COST/POWER 8-BIT QUAD PARALLEL DAC

8-Bit DAC Ideal for Digital Gain and Offset Adjustments in Portable Instruments



LOWEST PRICE

PART	DACs	SUPPLY CURRENT (µA max)	PACKAGE	PRICE* ($)
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MAX5101	3	520	16-TSSOP	2.39
MAX5100	4	700	20-TSSOP	2.59

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WAP speeds up mobile Internet

"WAP is a catalyst for the mobile Internet. By the year 2002, more people in the world will be able to surf the Internet via mobile phones than from stationary PCs," says Staffan Pehrson, who is Ericsson's Mr WAP.

As of December, Staffan Pehrson is head of Ericsson's WAP Program, which is intended to consolidate the company's activities in systems and coordination with terminal operations.

The unit has also developed the WAP Developer Zone, which is a web site where companies developing applications can find tips, advice and answers to WAP questions.

"We currently have contact with about 20,000 WAP development companies. The objective is to build relationships with the most successful, since many of them will also be developing services for third-generation mobile systems," says Staffan Pehrson.

WAP at the starting gate

According to Staffan, 1999 was a year of promotion for WAP. This year will see the introduction of a number of WAP phones from various manufacturers, and many WAP services will start to be used.

Staffan Pehrson

"WAP will be included in most telephones in the future," predicts Staffan Pehrson. "This will create enormous opportunities for companies developing WAP services for accessing the Internet via a mobile phone."

Today, WAP users can send e-mail, manage their home pages and access information-based web services. The next step will be banking services and transactions via mobile phones, as well as being able to read voice mail.

With WAP, users will have access to a number of Internet services via their mobile phones. Purchasing goods, ordering tickets, paying bills or reading the news will be possible from any location, whenever the user wants.

"The use of WAP will really take off with GPRS packet data technology. Then users will always be online and not have to wait during call set-up times. They will also be able to access the desired services quickly," says Staffan Pehrson.

Ericsson delivered the world's first WAP systems to Hong Kong operator SmarTone and to Norway's Telenor in June 1999.

"These deliveries took place on the same day that the WAP Forum approved the first open WAP standard, version 1.0," notes Staffan Pehrson proudly.

In Hong Kong, users were already able to read news on the web this summer using Ericsson's MC218 handheld computer and Ericsson's WAP gateway.

"To date, we have delivered more than 50 systems, most of which are being used for field tests, but there are also a number of commercial systems," reveals Staffan Pehrson.

Four major suppliers

There are four major suppliers of WAP systems. In addition to Ericsson, these include Nokia, the Dutch company SMG and the San Francisco-based Phone.com, whose solution is integrated with equipment from Alcatel, Siemens and Motorola.

"We have WAP systems for CDMA, TDMA and GSM in both Europe and the US," says Staffan Pehrson.

"Now it is important that both users, operators and application developers learn more about the mobile Internet in order to be able to take advantage of the bandwidth in third-generation mobile systems," continues Staffan Pehrson.

For operators, there are substantial business opportunities in mobile portals. When a mobile phone with less memory and a smaller screen than a stationary computer is used to surf the web, a portal is needed to obtain more functionality and assistance.

"This type of portal will be very valuable for wireless operators," predicts Staffan Pehrson.

Forum for development

The development of WAP is taking place through the WAP Forum, which was founded on Ericsson's initiative in 1997, together with Nokia, Unwired Planet and Motorola. The consortium also includes Microsoft, Palm and NTT DoCoMo, who have other solutions for allowing mobile users to read web pages.

NTT DoCoMo's iMode cellular data service currently has three million users and is growing by about 100,000 subscribers a week.

"This is fantastic. It shows the amount of interest for these services, even with today's low data speeds. We don't see iMode as a threat, however. Imode was developed for the Japanese cellular system PDC, while WAP is already a global standard. That makes a big difference," observes Staffan Pehrson.

Ericsson is working with NTT DoCoMo and others to develop WAP for third-generation mobile systems and tomorrow's HTML code, which is called XHTML.

"To encourage the spread of WAP technology and to increase use, we are also selling our WAP browser to other mobile phone manufacturers. A Korean manufacturer, for example, has purchased Ericsson's WAP browser," relates Staffan Pehrson.

Nils Sundström
nils.sundstrom@lme.ericsson.se

SpeakingMail talks to many

Type an e-mail message and send it to a mobile phone. On the way, the text is converted to speech, and when the recipient answers the phone, the message is read as synthetic speech. SpeakingMail is a new form of communication.

Speaking mail will be attractive to young people on the move, for example. When they are short of money, it may be difficult to call home as often as they or their family members might like. Today, many instead visit Internet cafés and stay in touch via a HotMail address. Now, however, there is another free alternative.

Kate who is out interrailing with her friends can go to an operator's website. There she enters her name, an e-mail address and a telephone number where she can currently be reached.

She types in her message: "Hi! Everything is fine. We left Paris on Thursday and took the night train to Nice. The weather is sunny. Please send more money."

Messages converted to speech

The written message is now converted to speech before the call is forwarded to Kate's mother's mobile phone. When she answers, the message is read, and she can choose from a number of pre-defined responses. If she presses 2, she answers "yes," while pressing 3 means "no." If she presses 1, Kate gets an acknowledgement that the message has been received. If, on the other hand, she presses Star, she will be connected to the number that Kate provided and can get more details on how the trip is going and where all the money is disappearing. This is registered as a normal call, for which Kate's mother will pay.

The advantages for the user are that the service is free, that it is easy to use and above all that it is fun.

"We believe that young people who currently send many SMS messages and keep in touch via e-mail will think that this is an exciting new way to communicate," says Per Erik Eriksson, who is the marketing manager for SpeakingMail.

The voice calls again and again

Why not just phone in the normal manner and leave a message if you don't get and answer?

"One advantage with e-mailing instead of calling is that your message does not end up in a voice mail box," explains Per Erik Eriksson. "A new attempt will be made to complete the call every hour for 24 hours until the recipient answers. Then, of course, the fact that it's free is a big plus."

Per Erik Eriksson

Ericsson has now finalized the technology for this service and is negotiating with several interested operators.

Per Erik Eriksson believes that operators will be able to dramatically increase the number of visitors to their websites by offering this service.

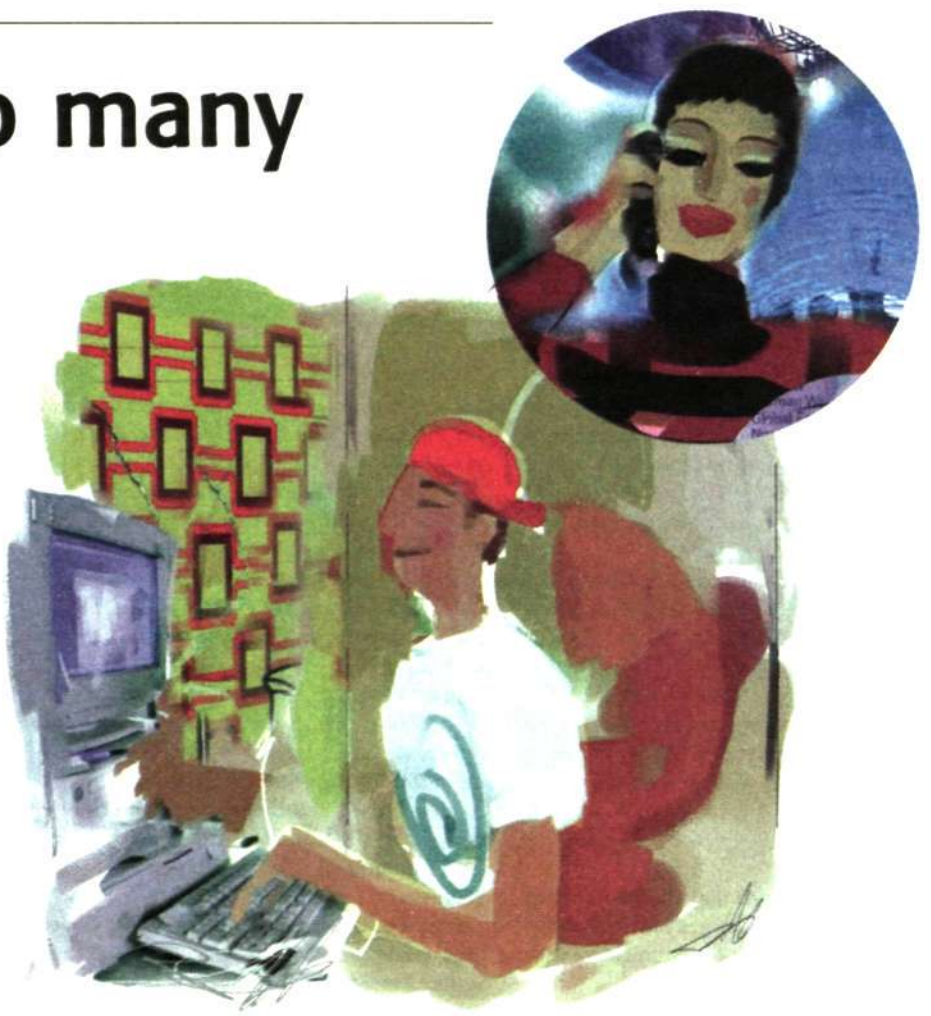

Illustration: Tove Sirri Antonsson

"This in turn will create significant opportunities for increasing advertising sales on the site," he continues. "They will be able to sell more banners at higher prices. In addition, it will be a means of profiling the company towards young people and everyone who likes exciting new forms of communication. And being perceived as market innovators is important to operators.

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Ericsson's competence center for IP security in Jorvas, Finland is leading the way towards secure communication over the Internet. The center is developing new solutions and planning which of Ericsson products will be the first to use IPSec. Esa Turtiainen, to the right, with his colleagues, from left, Tommi Linnakangas, Jari Arkko, Päivi Saarela, Sari Hietala, Jan Heinonen, Seppo Lindborg.

Photo: Niko Nurmi

Think-tank for IP security in Finland

"The keys to secure communication over the Internet are encryption and being sure that the person sending the message is who he says he is," say Ericsson's experts on IP security, a group of about a dozen persons located in Jorvas, Finland.

"The Internet leaks like a sieve! I can never know who's eavesdropping on my messages. I would never dare use my credit card on the Internet."

These are common and partially justified comments. The Internet has not been secure, and large parts of it remain unsecure.

However, much work is being done on IP security around the world, and offering customers reliable communications is becoming increasingly important for Ericsson. This is particularly true now that an increasing share of sensitive traffic is being carried over the Internet and that a growing number of new applications are creating new interfaces that increases network vulnerability.

Although Ericsson is considered be on the forefront from a technical standpoint, only a few products, such as Tigris and WLAN Guard, are currently available.

Esa Turtiainen, who is responsible for IPSec at Ericsson, began research into the subject about ten years ago. He provides a number of hair-raising examples of the threats against the Internet.

Many threats

"As if it weren't enough that an unauthorized person can read my messages relatively easily, I don't even know if I'm communicating with the right person," says Esa Turtiainen.

"A foreign router or data switch can register itself as the best path, completely in accordance with the Internet's principles, and thus be able to read or distort my messages."

In the case that is called "the man in the middle," A believes that he is communicating with B, but all communication is being routed via a third-party C, who forwards the password unchanged but is able to modify the message.

An even worse threat is called the Replay Attack. In this case, an intruder intercepts a bank transaction, which is replayed hundreds of times.

Nearly as disturbing are traffic analyses that allow a third party to see who is communicating with whom. Other threats are hijacking or what is called the Ping of Death.

Fragile Internet

There are reasons why the Internet is so fragile. An Internet switch is not as secure as a telephone switch.

This is partly because a router handles one data packet at a time and cannot guarantee that it has been received from the correct sender, since the router does not remember where the last packet came from. It only cares about sending each packet onward to the correct address.

In addition, the entire Internet is based on IP addresses, which in themselves are not secure, and the principle of sending data via the nearest path from one point to another. Routers broadcast their own status, including how close they are located, which creates opportunities for those familiar with IP addresses.

Even if a virtual private network (VPN) has been established with reliable ISPs (Internet Service Providers) who tunnel the information across the Internet and do not allow intruders, the data can still be routed via a foreign router, where it can be manipulated by adding false bits, for example.

This is because Domain Name Servers (DNS), which keep track of IP addresses, can be fooled into providing false IP addresses.

"In this context, it is important to remember that IPSec is not only a question of technology, but also a matter of money, risks and how much security is worth," says Esa Turtiainen.

The two faces of encryption

The solution available today, which is now being standardized, is IPSec, that is, IP Security. IPSec consists of encryption and authentication. Encryption ensures that unauthorized parties who succeed in intercepting messages will not be able to read them.

Encryption consists of a public portion, which is a known algorithm, and a private portion, which is a key. Encryption may be symmetric or asymmetric, meaning that the same key or different keys are used to encode and decode a message.

Asymmetric methods, such as RSA, provide a private key for the receiver used for decoding the message, meaning that the encryption key can be made public.

The technology is highly secure, but it is slow and many times impractical.

The vulnerability of an encryption key is related to its length. The longer the key, the more time it takes a hacker to crack it.

Common lengths are 40 or 56 bit keys, such as those used in DES (Data Encryption Standard), which is currently the most common and standardized method. Even 64-bit keys, however, can be cracked in less than a day with a reasonable amount of effort.

Authenticity difficult to establish

Keys do not become really secure until they are at least 100 bits, which introduces a further complication. Encryption may not become too strong, so that law enforcement authorities are hindered in their work. This is an important concern in the US.

Encryption is supplemented by ensuring that the link from A to B is secure in order to guarantee that communication is taking place with an authorized party and that the message has not been intercepted or modified.

This is accomplished by verifying who is initiating a transmission and verifying the sender's identity.

One difficulty lies in establishing an unambiguous identity. One method is to employ digital signatures that have been approved by a Certification Authority (CA).

In this case, two keys are used. A private key allows only the sender to encrypt his or her identity, while a public key allows anyone to decrypt it. Using sophisticated methods for encryption and decryption, it is possible to verify the person's identity and the validity of the message.

A secure connection

In IPSec, the authentication problem is solved using the IKE (Internet Key Exchange) protocol. When communication has been established between two nodes, IKE negotiates suitable parameters, such as encryption algorithm and key length, to establish a secure connection.

As soon as the two nodes have used IKE to agree on how to communicate, the exchange of the actual data packets can begin.

These packets, in turn, are protected, either with an Authentication Header (AH), according to IPSec or an EPS (Encapsulating Security Payload) protocol.

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Competence center staffed by experts

Ericsson's competence center for IPSec was established in April 1999 at LMF, Ericsson's local company in Finland. Operations are financed by the corporate research unit or various projects. Some 20 persons work at the unit, which coordinates Ericsson's activities in this area.

Esa Turtiainen heads the unit, while Jari Arkko is the technical expert and a well-known guru in the field. Sari Hietala is responsible for business intelligence, and Seppo Lindborg is responsible for export controls and patents. Päivi Saarela is responsible for market communications. The unit's main responsibility is developing software solutions for the product units that need IPSec.

Development and purchasing

To this end, the competence center has acquired the most sophisticated IPSec technology, both through purchasing and its own development.

The solutions being developed, which are free to be used throughout Ericsson, have already been incorporated in several products.

The group is now continuing with the development of basic technology, while helping product units to incorporate IPSec into their products.

Self-evident components

In addition to this work, the unit monitors development in the IPSec field and participates in global standardization efforts. The solutions created by the group are made available to all of Ericsson. A roadmap is being developed for the introduction and integration of IPSec into various Ericsson products.

"In time, IPSec and IKE will become self-evident components in nearly all Ericsson products," predicts Esa Turtiainen.

"First in line are the fast-growing products such as GPRS for cellular operators, Tigris for Internet Service Providers and VPN routers, and WLAN for wireless access to local networks, where we see tremendous interest from the product units," concludes Esa Turtiainen.

Lars Cederquist

MORE READING

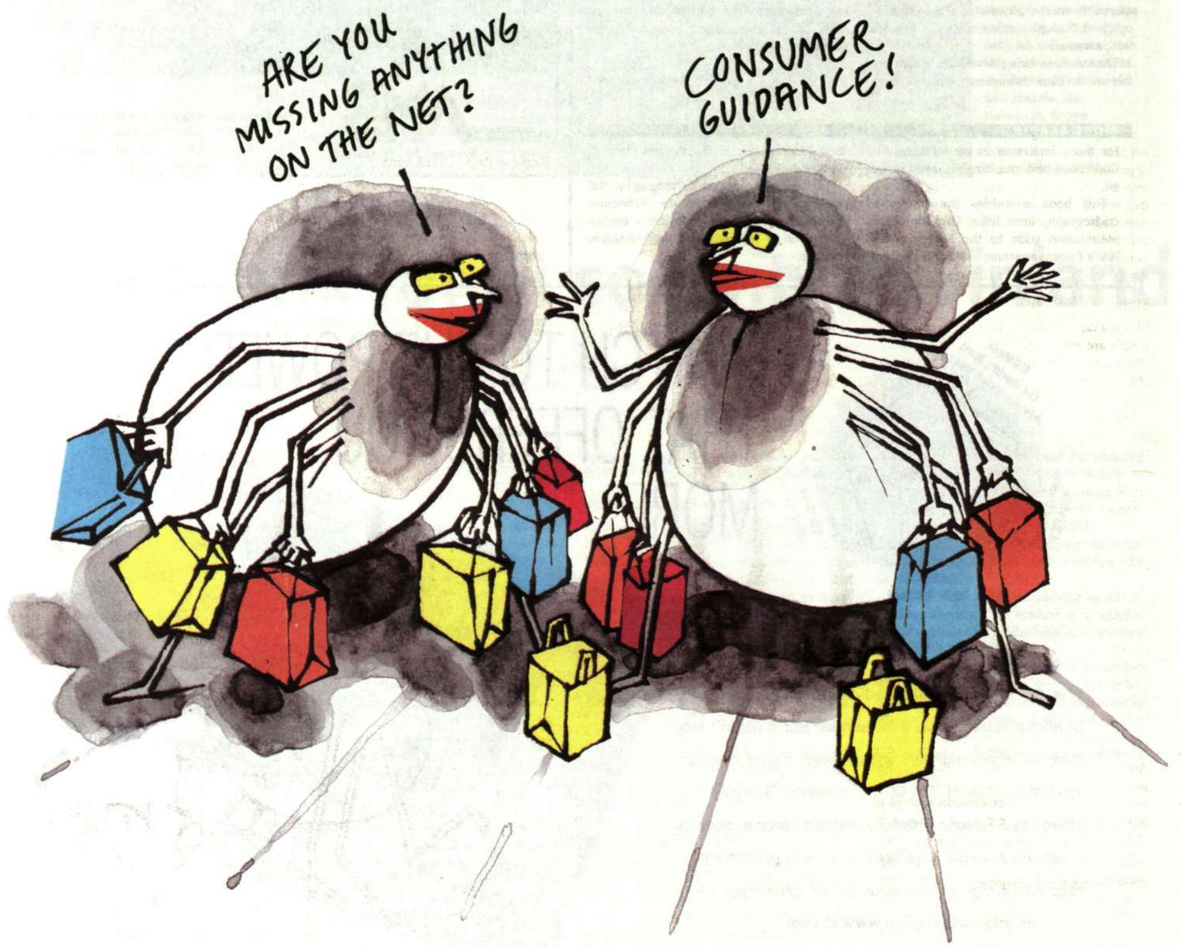
For those interested in cryptography, The Code Book by Simon Singh is recommended.

This book chronicles the history of cryptography from Julius Caesar's simple substitution code to the Second World War's Enigma machine and future encryption schemes based on quantum computers.

In the book Applied Cryptography, the well-known specialist Bruce Schneider describes the latest developments in cryptography in a technical but very readable manner.

Although shopping on the Internet is increasing, there is widespread scepticism among ordinary people. Several studies show that consumers are hesitant, a trend that has attracted the attention of several new web sites that provide various forms of consumer information.

Better communications strengthen consumer position



WHEN YOU USE CONSUMER GUIDES

- When you visit a web site that claims to provide consumer information, you should first determine if it is serious by reading the fine print.

  Especially important is that the web site is independent in relation to suppliers.
- Be particularly cautious with new players in the market.
- The service should be free, unless it covers very special areas or is an exception to the rule, such as Consumer Reports online.
- Even if most consumer-oriented services are free, it can be good to know that your choices and your actions on the web are not being logged in a database that in the worst case may be sold to suppliers. Look for a privacy policy.
- Make sure that all costs are included in the prices reported (shipping, tax and any other charges).

Shopping on a web site requires taking several major steps. Inadequate product information and uncertainty about the purchasing process are the first obstacles, and completing the process by entering a credit card number can make even the most seasoned Internet users back out. If, despite all obstacles, you finally make a purchase, there may be a long wait before the product is actually delivered. It still happens that it is never delivered at all.

This is a pessimistic scenario. It's not always this bad, but there is no question that prospective consumers on the Internet need help. A number of new web services have emerged to fill the gap.

Several of them, including the US sites Epinion and Deja.com, have taken advantage of the opportunities the Internet creates for people to inform others at any time and tell them about the value of a product or service. Someone who wants to buy a car from Honest Harry Autos, for example, possibly an English Land Rover, can go to Epinion or Deja.com and look for new Land Rover owners to get their opinion.

Suitable for Swedes

This is a capability that also suits Swedes, since people are increasingly being forced to make choices in areas were there previously were no other alternatives than those offered by state-owned companies.

The number of choices has become so great and so complicated that it is now almost impossible to understand what is being offered. Choosing a telecom operator or finding the cheapest supplier of electricity has proven to be a time-consuming process.

Americans, of course, are used to this and have long had access to relatively strong consumer organizations. Since the US also has the world's greatest number of Internet users, the expanded communications capability is being used by several consumer organizations. One example is the magazine Consumer Reports, which for 63 years has been defending the right of Americans to make informed product choices. The magazine made its debut on the Internet in 1997, but has been available through older online systems for nearly two decades.

Consumer Reports is so well respected among Americans that its web service Consumer Reports online has succeeded in getting 300,000 users to pay several dollars a month. Only Wall Street Journal Interactive has been more successful on the web, where everything is normally free.

Consumers tell consumers

A web service with a different background and a slightly different approach is the relatively newly started Epinion, based in Mountain View in the heart of Silicon Valley. Instead of having a staff of journalists to assess products, Epinion takes advantage of the consumer's desire to talk about their purchases, whether successful or otherwise.

"Epinion offers an environment that makes it easy to provide tips or warnings about products," says the site's founder Mike Speiser.

As so often with the Internet, the idea for Epinion was hatched at a meeting of entrepreneurs and venture capitalists. The concept was immediately given a business plan, and after an infusion of risk capital, the web site was opened in early September last year.

"We moved from concept to launch in just a few months and never had any problem finding risk capital. Despite minimal marketing, we are already logging more than 1.5 million visitors per month," says Mike Speiser proudly.

Epinion received considerable coverage in the media, however, which undoubtedly drew many visitors. The web service encourages everyone to participate actively in the exchange of information. Reviews are not edited, and all contributions are welcome. There is also a bonus system for frequent and reliable reviewers.

"We call it a friendship system in which skilled reviewers are praised and given recognition," explains Mike Speiser.

Ericsson's phones reviewed

The concept seems to be successful. Many reviews are a joy to read – particularly when the reviewer is not satisfied with a product or a service.

Several of Ericsson's mobile phones are reviewed, as are many products from the company's competitors. Epinion is a veritable gold mine even for companies, since it allows them to monitor reactions to products and services.

Mike Speiser

The distribution between angry and satisfied reviewers is fairly even, something that Mike Speiser and Epinion seem to encourage.

"We encourage reviewers to describe both positive and negative aspects of the products they review," he notes.

But good writers may also be bluffing. And how is it possible to be sure that a company is not manipulating users by reviewing their own products? Do users need to be suspicious? Not according to Mike Speiser, who asserts that it is almost impossible to cheat.

Reviewers recommended

"It's possible in theory, but to protect us, there is a friendship system by which reviewers must provide dozens of good reviews before they are recognized as recommended reviewers. And it's not easy. Only a few actually make it. The grading system sorts out the wheat from the chaff," says Mike Speiser, emphasizing that user behavior on the web site is not used for commercial purposes either.

"That would destroy the confidence that we have built up. The only time we use visitor statistics is in improving the content on Epinion in order to make things easier for our users," says Mike Speiser.

Services evaluated

A similar attitude towards creating trust characterizes David Bäckström, who together with Jonas Almquist founded a Swedish web site for consumer guidance named Spara Pengar (Save Money). Unlike Epinion, which evaluates many products in a large number of categories, Spara Pengar focuses solely on services, offering advice on choosing among electricity suppliers, telecom operators, mortgages and insurance policies.

"We build confidence by ensuring that all information is correct," says David Bäckström. "We even employ a number of specialists in each area to ensure that there are no doubts."

David Bäckström

The founders of this service are two former owners of a camping ground who in 1997 realized that it was difficult to identify the cheapest electricity supplier for their camping ground.

"It was almost impossible to evaluate the various alternatives. Since both Jonas and I were using the Internet, we realized that it could offer excellent support for ordinary consumers," says David Bäckström.

Step-by-step instructions

Spara Pengar, which launched its site nearly a year ago, offers step-by-step instructions. Users select the area or sector in which they want to find the best supplier. They then enter information as prompted, and the web services searches for the best supplier. Users must then contact the supplier themselves.

WEB ADDRESSES

- American consumers comment on products and services: www.epinion.com
- More US consumers express opinions on products and services: www.deja.com
- An institution for consumer guidance: www.consumerreports.org

In purchasing services, price is not always the determining factor. Quality is also important, and more difficult to judge.

This is probably the most important reason why most people only purchase standard products via the Internet where price and possibly delivery time are the most important parameters, not quality.

The most well-known examples are naturally books and CDs, but the number of Internet shops is increasingly constantly. How do you find the lowest price of a best-selling book when there may be 15 web-based book stores to choose from?

There are web services that can answer this question, as well. These services are sometimes called purchasing agents, which are actually efficient search programs that can search through a large number of databases and catalogues. These services can be regarded as a form of automated consumer guides.

There are already many agents hunting for the lowest price. A relatively new Swedish shopping agent called Red Elvis was launched by Bonnier Music.

Red Elvis claims to help consumers to find the best price using a service called Search4BestDeal. It searches for music in eight record stores, books in seven book stores, film in six stores and computer games in a similar number of Internet stores. The service compiles information from these web sites and summarizes and presents the results in Swedish currency.

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Illustrations: Ulf Frödin

Virtual office for those on the move

Working on the move has become easier and faster. Say that you have a meeting with a client in the morning, but you'd like to check your e-mail first. In the past, you had to go to the office to read and answer your messages before rushing off to your meeting at the other end of town. Now, using EVO, it will be possible for you to do your work when it fits your schedule.

Ericsson Virtual Office (EVO) was commercially launched last May. Following comprehensive testing, EVO is now being implemented internally as well. This means that all Ericsson employees will have the option to use the new software, enabling them to connect to the company intranet via mobile phone, taking advantage of the network even when on the road. In other words, EVO is a tool aimed especially at those who spend a large portion of their time outside of the office.

It is no longer necessary to look for a telephone jack, following a client meeting, to create notes since a connection can be made using a mobile phone. Computer terminals at work will no longer be the only place providing access to the information. You'll be able to work just as easily from home as in the office.

A long-standing policy at Ericsson says that the company should use its own products internally. By implementing EVO within the company, Ericsson hopes to boost external sales as well. This move will also provide employees with an opportunity to acquire experience and insight into promoting the product in the marketplace.

Just like the office

The new version of EVO for remote access will provide access to files, the web and e-mail in a faster, more straightforward manner. In the past, it was both difficult and slow to conduct work using mobile data, but thanks to EVO, it will be both simpler and three times as fast.

"The basic concept behind EVO has been that you wouldn't experience any differences between working on the mobile link as compared with being in the office," says Paddy O'Leary, marketing manager for Mobile Office.

Following Ericsson's strategy for mobile Internet, EVO operates using various terminals such as PDAs, Palmpilots and laptops. The software is easy to learn and uses the same interface as Microsoft Outlook. To connect to the company's intranet/extranet via EVO, you use the same procedure as always, providing user name and password. The only difference is that you need two passwords rather than one.

For those who are frequently on the move, EVO will enable wireless remote access via the Internet.

"It only takes ten minutes to learn how to use EVO," says Paddy O'Leary.

It takes less than 30 seconds to connect to the company's server, and users are able to see what is happening during the connection. The image on-screen consists of three parts. Once joined together, the connection has been completed. Should the connection fail for any reason, it is easy to see which part is malfunctioning before calling the company's support unit.

Compressed for speed

All documents transmitted or received using EVO are encrypted. Fast connection times have been achieved through data compression. Prior to transmission, documents are organized into binary packets.

"By doing so, transmission speeds are three to five times faster compared with the ordinary method of sending data over mobile phones," says Christer Freander, head of Mobile Office at Ericsson Radio Systems.

Employees in Europe and the US will be able to order the product starting February 1. Others will have to wait until the end of May.

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Electronic invoicing a success

Quickfix, a system that enables invoices to be sent electronically within the company, has already handled approximately 70,000 invoices.

"After four months, that is a savings of over SEK 17 million," according to project manager Håkan Beckman at IT Services.

Electronic invoicing saves both time and money. That is why Ericsson Radio Systems, Ericsson Mobile Communications, Ericsson Telecom, Ericsson Business Networks and Microwave Systems chose to invest in Electronic Data Interchange (EDI) for their internal billing.

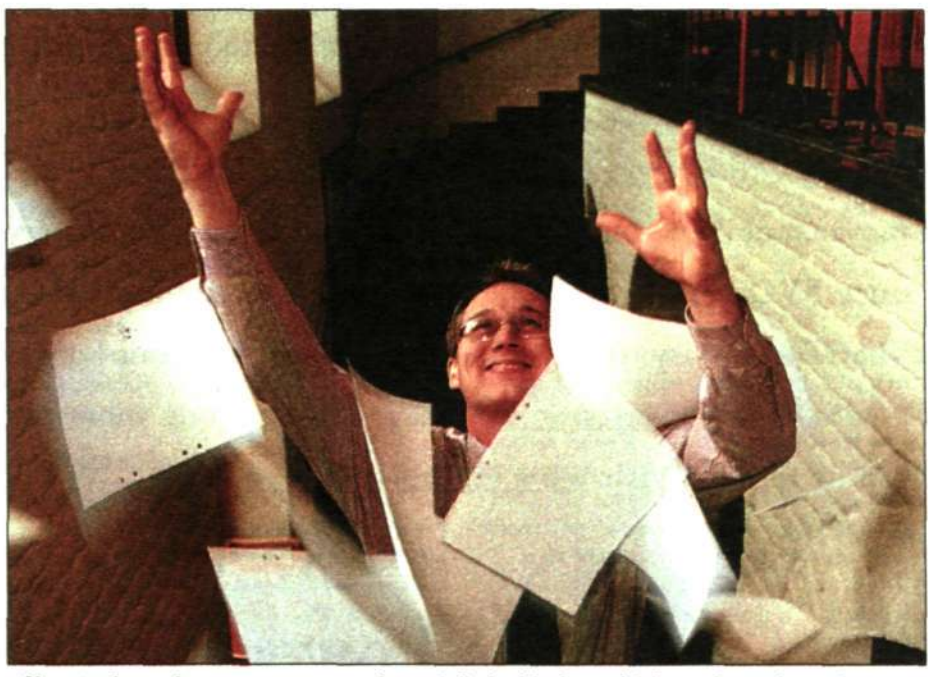
Altogether, these companies issue approximately 250,000 invoices a year to various local companies. Quite a bit of money can be saved for both the sender and the recipient through less paperwork. According to one estimate, the amount of savings could be as much as SEK 250 per invoice.

Still possible to join

In order to implement electronic invoicing on a large scale, the Quickfix joint project was launched in June 1998. The project is now formally over, although as a result of the moratorium on changes in conjunction with the millennium shift, certain portions will be extended.

Local companies still have the opportunity of joining the system for free through April 30.

"That means that all the companies who are interested in joining have until then to decide," explains project manager Håkan Beckman. In addition to the five "issuing companies," there are currently approximately 170 local companies receiving. Many of them joined last autumn, but a steady stream of new companies have continued to join since then.



Håkan Beckman has every reason to be satisfied with the Quickfix project. After only one year of electronic invoicing, the system has saved the company over SEK 17 million.
Photo: Lars Åström

Ericsson in the U.S. is one of the local companies that has chosen to join Quickfix. The company's financial manager in Dallas, Michael Gillert, is optimistic.

"We're saving both time and money and are very satisfied. Since we have access to the invoices online, we're able to deal with them quickly and efficiently. Currently, we're receiving about 1,000 electronic invoices a month, and that number is growing," says Michael Gillert.

The system has exceeded Håkan Beckman's expectations. "The goal we established for ourselves was easily surpassed."

As part of the Quickfix project, a unified Ericsson invoice has been developed along with other customized systems. From a technical standpoint, payment invoices are sent to a hub known as the EDI Processing Center. The center stores information regarding how various local companies prefer to receive their invoices, sending them automatically to the appropriate financial system.

The project group has also overseen the replacement of Navet and Match – tools that Ericsson companies use to balance their internal invoicing. The result is a new, web-based system called Pari.

"It's been a success. Approximately 100 companies were part of Navet before. Now there are roughly 170 companies using Pari. The new system considerably reduces the length of time the work takes," says Håkan Beckman.

Other applications

A special web-based application has also been developed for invoices. It goes by the name of web-Bill and makes it possible to easily view invoices, print them out and download them as files.

"There are several major advantages to Quickfix. For one, it improves the flow of capital. We've also developed a good technical platform that can be re-used for other kinds of information transmissions. The next step is to expand the flow of invoices, so that it doesn't only involve payment invoices, but also items such as transport and credit invoices."

"In time, our goal is for invoices to flow electronically between all Ericsson companies. Ideally, all company invoices would be handled electronically, both internal ones and those that come from outside the company," says Håkan Beckman.

Once the project is over, the Financial Service Center will oversee the outcome of Quickfix.

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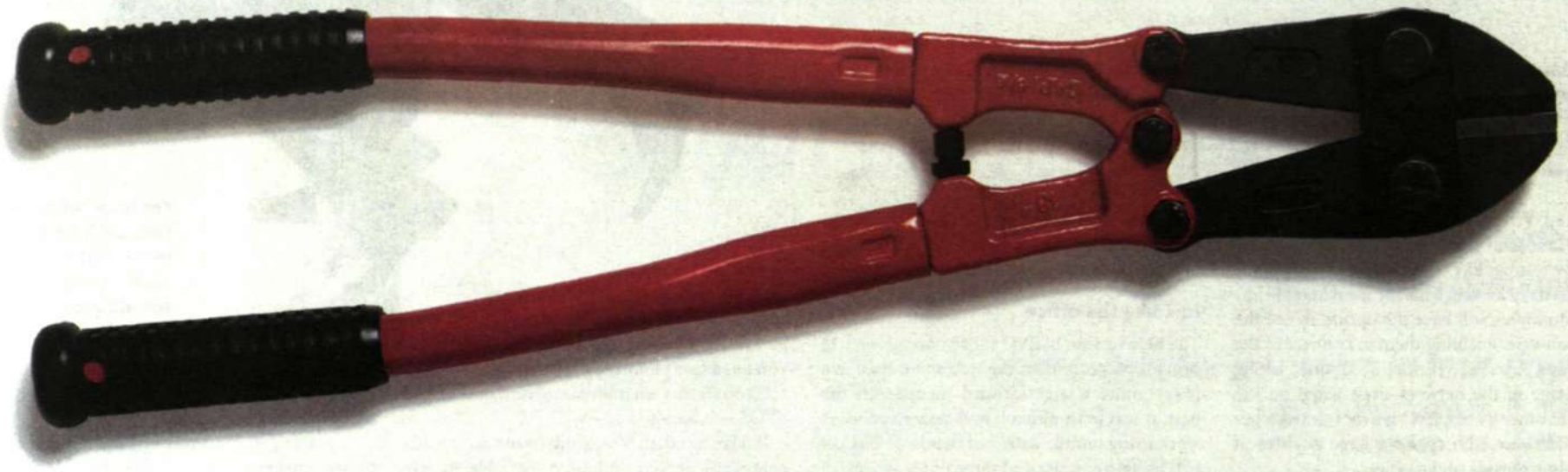
EVO, the wireless link to the network



Cut loose from your desk!

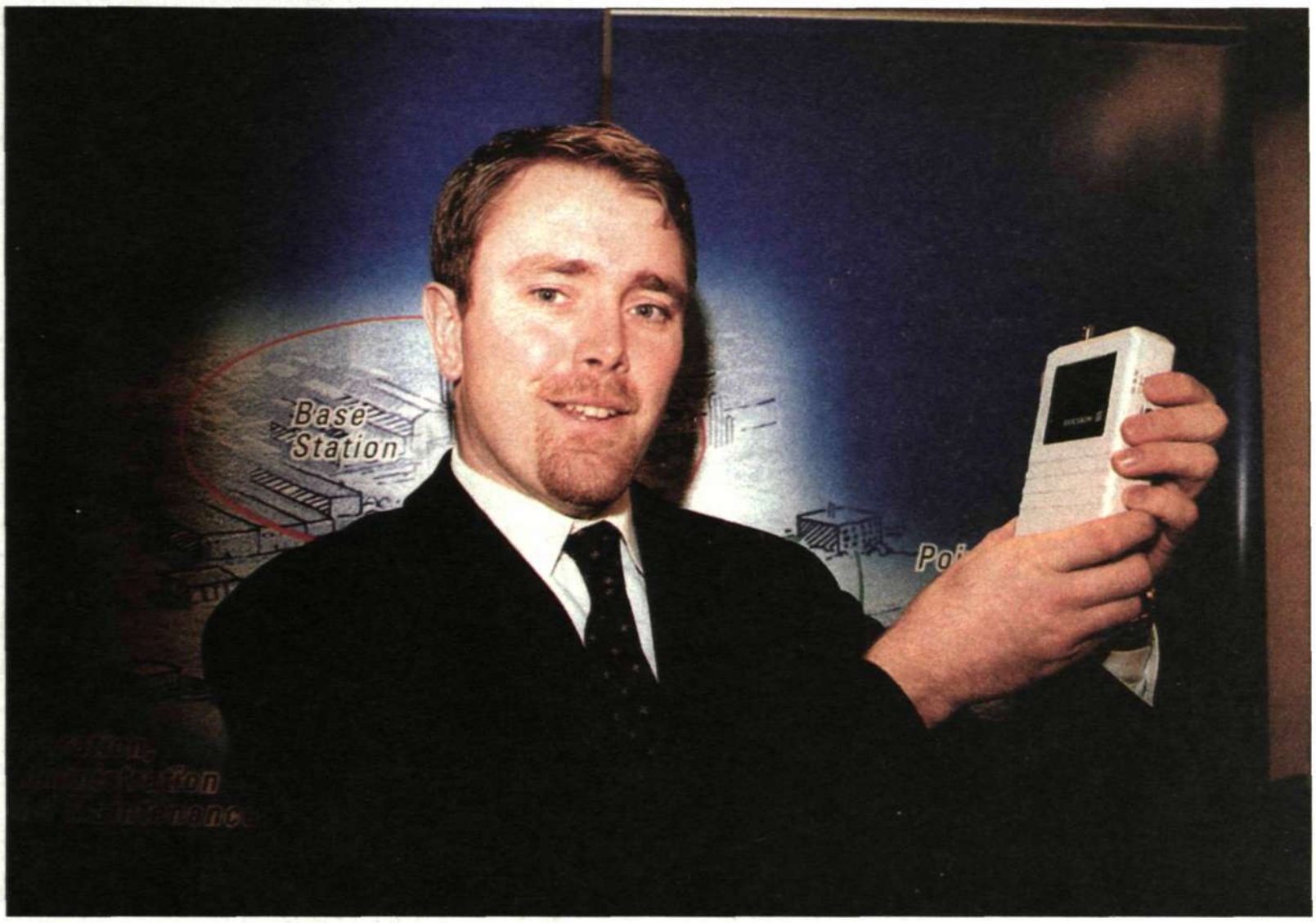
Chained to your workplace? Feel like you're wasting valuable time at the office, just to check your e-mail and get information from the Intranet?

Don't despair – EVO is here. Sharpened and ready to cut the chains that are holding you down.

Ericsson Virtual Office gives you faster and more secure remote access to the Intranet and moves mobile access from a mere possibility to a necessary business reality. And since EVO is now available as part of the standard Ericsson Office Environment (ESOE), it's easy to get and easy to install. Find out how to get your freedom back and visit evo.ericsson.se today. To find out more about what exactly EVO can do for you, visit www.ericsson.com/evo.

The Power of Mobility

ERICSSON



Anders Smedberg is marketing manager for Beewip, a new broadband product from the Fixed Radio Access business unit.

Photo: Lars Åström

Wireless broadband access finally coming to the home

Ericsson is launching a new radio access system called Beewip to provide broadband service to small offices and households in urban areas. Radio communication uses packet switching on the high-frequency 3.5 GHz band. Each base station is able to handle up to 500 subscribers.

"We call our system Broadband Wireless IP or Beewip," says Anders Smedberg, marketing manager for the new product at the Fixed Radio Access business unit. "Licenses for the 3.5 GHz band are currently being allocated in most countries around the world, and our vision is that there will be a mass market among home users within a couple of years."

Beewip is an enhancement of a technology called RLL (Radio in the Local Loop), subsequently called WLL or Wireless Local Loop, which is a method of using wireless technology for fixed telephony. Ericsson is the leader in WLL, with an installed capacity of one million lines.

Conventional WLL uses radio instead of copper wire to provide a connection from the fixed network's local exchange to residents of an apartment building, for example. Beewip is based on the WLL principle, but offers significantly higher data speeds of up to 3 Mbit/s per subscriber and uses CDMA frequency hopping and packet switching for data. The system is connected both to the fixed network (PSTN, Public Switched Telephone Network) and the Internet. Beewip is a new method for Internet access that offers broadband data services and Voice over IP.

Broadband

A Beewip network is built in the following manner. An operator who has been awarded a license first identifies where there are prospective customers and then searches for suitable base station sites. Each base station serves a given area, but the different areas do not have to be contiguous as in a mobile telephone system. Each base station is connected to a so-called PoP (Point of Presence), from which the operator monitors the network via an operations and maintenance system.

The standard used for broadband communication over radio is IEEE 802.11, which is the same protocol used for wireless LANs and which is a form of airborne Ethernet. The connection between the radio base stations and the backbone network can be a microwave link or an optic cable.

Shared capacity

In the standard configuration, the base station transmits in six 60-degree sectors, each with a capacity of 3 Mbit/s. All users within a sector each have a directional antenna and an indoor unit and share the 3 Mbit/s radio capacity, which is only used when data is being sent or received. If we assume that each user is only sending or receiving data 10 percent of the time and that the speed is about 256 kbit/s, then each base station can handle about 500 subscribers.

"The services that we envision include Internet access, e-mail, web browsing, Voice over IP and LAN interconnection," says Anders Smedberg. "For operators, this will be a way to quickly offer subscribers a second line with broadband capacity."

Bold ideas

The Beewip project is one of Ericsson's many development projects for new technology in which bold ideas are given rein. The project has grown in scope so that there are now 50 persons working with the product, which is already being tested by selected Ericsson customers. The first public launch of the product will be at the giant CeBIT exhibition. After that, the future looks bright.

"This will be an interesting alternative to fixed broadband access methods that include cable-TV modems, xDSL, fiber and power lines," says Anders Smedberg. With respect to wireless IP, Beewip has a natural place in the layer between PMP (Point-to-Multi-Point) solutions in the 26 GHz band and third-generation mobile telephony.

"We need to get on the market quickly, however," notes Anders Smedberg. "That's why we have purchased products and concentrated on integrating them and creating a total solution that includes the base station concept, operation and management of the system, as well as the associated services. This will not be a volume product initially. Instead, the first six months will be devoted to creating a presence in the market that will open a mass market in time."

Targeted operators currently include existing cellular operators, ISPs and WLL operators. The major competitors are Alcatel, Marconi, Nokia, Lucent and Siemens, which are all working with similar solutions.

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WHAT IS BROADBAND

By definition, broadband designates a transmission speed of at least 2 Mbit/s or two million bits per second. Broadband is thus not a system or a technology, but rather refers to speed or capacity.

For low speeds, the term is narrowband, while higher speeds, from several hundred kbit/s up to 2 Mbit/s, is called wideband, a term that is used in Wideband CDMA, which is the radio technology for the next generation of mobile telephony.

Broadband has become a buzzword that gives the impression of unlimited possibilities through being constantly connected to the Internet. When politicians talk about broadband for the masses, it sounds like a huge construction project, with high-speed information highways and broad on-ramps for everyone and local networks in every apartment building. The truth is, however, that there are several alternatives, all of which require money and investment, and that many people must share the Internet. Even if the superhighways are there and your driveway is broad and smoothly paved, you will quickly have to slam on the breaks when you get out on the highway with all the other Internet users.

A distinction is also commonly made between switched and shared networks. In a switched network, each user is guaranteed a certain capacity – which extends out to the Internet, where no one can promise anything – while a shared network, such as cable-TV, makes no promises. A LAN can be both shared and switched, but switched networks are much more expensive. ADSL is an example of a technology with dedicated capacity for each user.

Ericsson is working with several broadband technologies, which include xDSL solutions for the existing copper network, high-speed radio using microwave links, cable-TV modems and broadband satellite systems, as well as wireless LAN technology for fixed radio access.

contact it/ip

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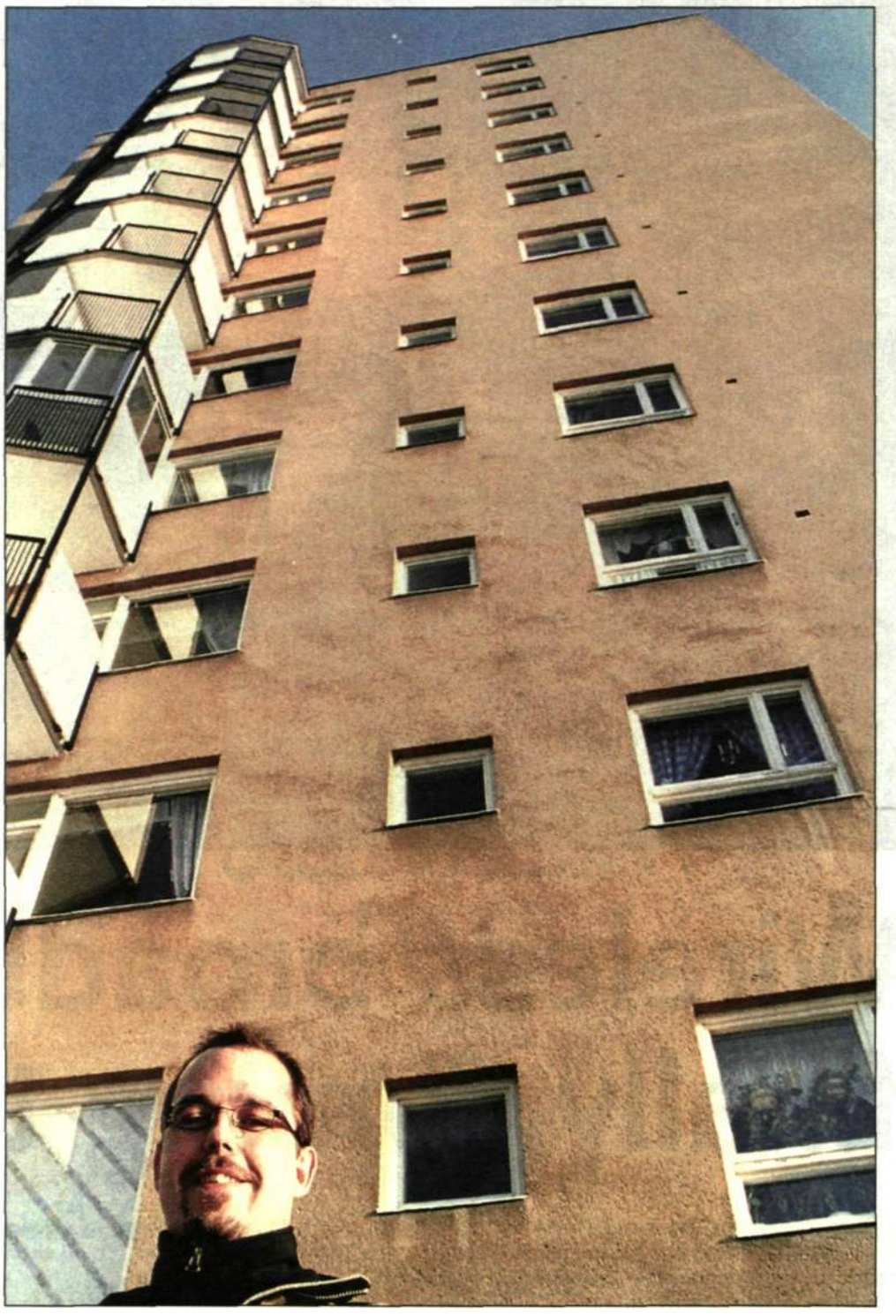
An ordinary apartment building in Vällingby, Stockholm, is one of the first to gain access to broadband. Jonas Mattson, who is responsible for technology and operations at Bolab, wishes that broadband services could be developed faster.

Photo: Jezzica Sunmo



Rose Johansson thinks that broadband is exciting. With her home terminal she is in direct contact with the maintenance staff for her building and can even book the laundry room or see who is downstairs at the entrance. "New technology makes my life easier," she says.

It looks like an ordinary apartment house. What's going on inside, however, is a pioneer project. Rose Johansson and her neighbors are being connected to a local broadband network. While engineers around the world ponder over network architectures for broadband, Rose Johansson is wondering what it will all mean for her.

Broadband pioneers

A five-storey apartment building from the 1950s is the first test site for municipal housing company Svenska Bostäder's (SVB) planned broadband island in the Stockholm suburb of Vällingby. Assisted by Ericsson, SVB is building a local communications network with broadband capacity.

Soon every tenant in the building will have a home terminal in the hallway where users can book the laundry room without having to take the elevator down to the basement and put their names on the list.

The terminal can also be used to notify the maintenance staff about leaks in the bathroom and to suggest times when the plumber may come.

Jonas Mattson, who is responsible for the technical installation and operation, enters important information to tenants on the PC in his office. In the same instant, the information is available in each home.

The home terminal will also function as a video phone on which tenants can view visitors ringing their bell at the building entrance.

Jonas Mattson works for Bolab, which is a unit within SVB that ensures that new technology will benefit tenants.

He is currently working on developing the services that will be offered over broadband and feels that his job has only just begun.

Avid web surfer

For recently retired Rose, however, the broadband network has already brought major changes. Of course, she already had a home PC when SVB decided to install broadband, but she had not bothered to sign up for the Internet.

Now she is constantly connected and an avid web surfer.

"I don't read daily newspapers anymore," she reveals. "I read the news on the Internet, so I always get the very latest bulletins."

Recipes, horoscopes, information on the mutual funds in which she has invested and tips about upcoming events are just a few of the things that Rose now finds on the Internet. And she couldn't be more enthusiastic.

"All this new technology is so exciting," she gushes. "It makes life so much easier."

Not having to connect to the Internet via modem is a major advantage.

"Modems don't always seem to work," notes Rose, whose brother has a much more modern computer with a sophisticated modem. "When he visited me and saw how my Internet connection works, he was really impressed."

Jonas Mattson explains that none of the services that Rose Johansson uses really demand broadband. Only when real-time video is shown does broadband become a necessity. Jonas Mattson also admits that he wishes that the development of broadband services was moving a little faster.

Choice of TV programs

He envisions a future in which everyone can decide when they want to see a certain TV program. Just as users can now find radio news broadcasts on the Internet and listen to them at their leisure, the same should be possible with TV.

"Internet shopping could allow you to really visit a virtual store where you can pick up items and examine them," continues Jonas Mattson. "And if you want to go to the movies or the theater, you might be able to get a preview over the Net so you can see if you're interested."

Jonas Mattson describes an apartment in the neighborhood that is currently empty. Every time he has to go there, he can hardly open the door for all the direct advertising that has been dropped on the hall floor through the mail slot.

"When all households have broadband, local merchants could send advertisements over the Net, thus eliminating printing and distribution costs and reducing all the paper.

Rose Johansson is glad that her building was the first. She thinks the new network is exciting.

"I don't know exactly how it works," she admits, "but I've had it explained to me that broadband is like a broad, straight highway, whereas the ordinary network is like a narrow, winding road."

"A single infrastructure for all services. That's the idea behind broadband," explains Jonas Mattson. "Instead of one network for telephony, another for data and yet another for TV, all services should use the same infrastructure."

Capacity in the network will be sufficient to allow all households to make phone calls, surf the Internet and watch TV at the same time.

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