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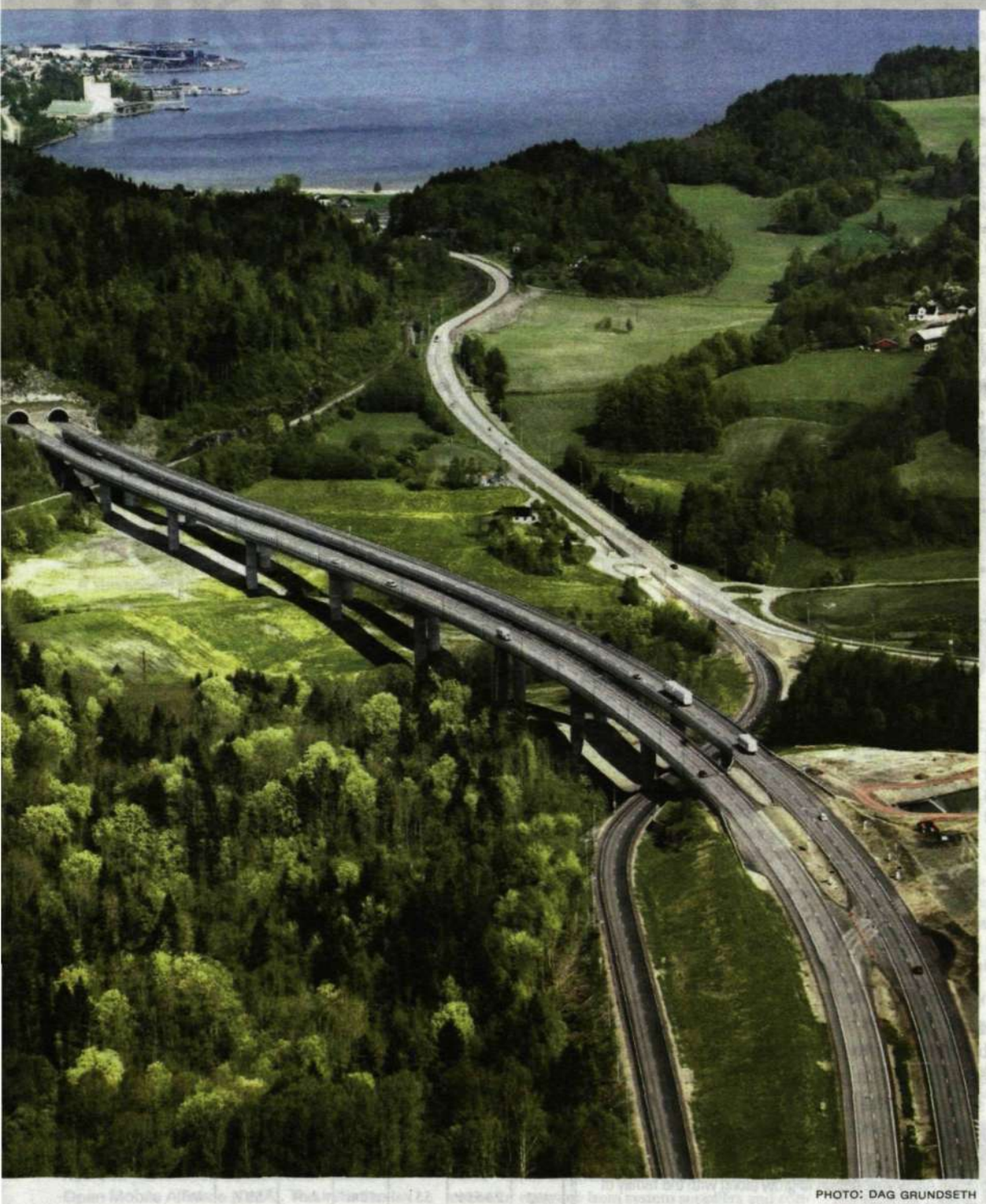

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THE PUBLICATION FOR ERICSSON EMPLOYEES ALL OVER THE WORLD

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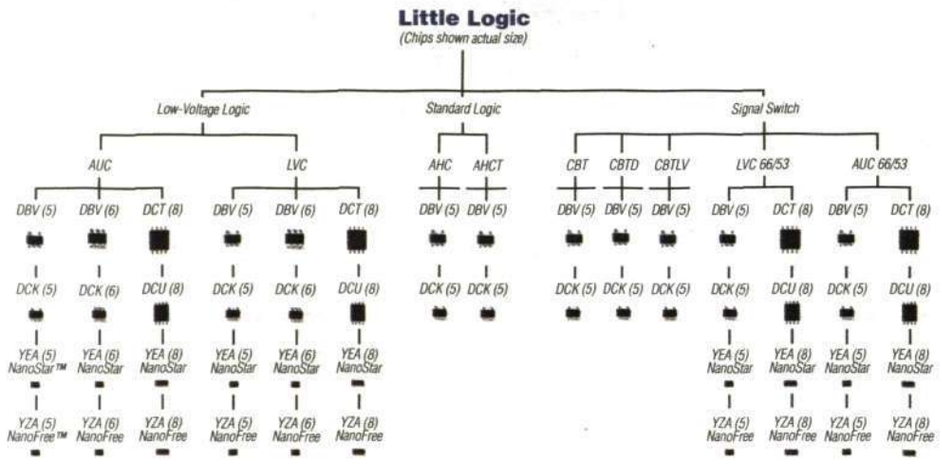

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TEXAS INSTRUMENTS

Systems takes shape

Business Unit Systems has now determined what resources are needed to fulfill their mission. When Systems moves to its new building in Kista in August, it will consist of approximately 1,200 employees.

"More than 700 people within our business unit will have to leave the organization. But I can't give an exact number, because it all depends on the negotiation with the unions, says Bert Nordberg, head of Systems.

The terms of the redundancies have already been negotiated. According to Bert Nordberg, all employees affected will get information from their managers with a clear definition on what kind of support they can expect from their organization. He assures that he will do everything he can to help the employees that are made redundant.

"There will be support programs for the employees. We're also scanning the market and our partners to see if they have needs for competence. The aim is to get them to hire people from Ericsson.

It strengthens the partnerships with the companies that we want to be partners with. It's of course very beneficial for us if they employ former Ericsson staff."

Bert Nordberg sees making people redundant as the worst part of being a manager and hopes that it will show that Ericsson has learned from the mistakes in the past.

"It's really sad, because I personally think that it's very hard to make this a good process. You can do it with respect, you can do it with ethics, but for the people concerned it can never be a positive message that they lose their job."

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Bert Nordberg, head of Systems, is confident that the current redundancies show that Ericsson has learned from its mistakes in the past.

PHOTO: PELLE HALLERT

New global alliance

The world's leading telecom manufacturers, mobile phone operators, IT companies and application developers are joining forces in a new standardization collaboration called Open Mobile Alliance (OMA). The initiative is the most extensive to date within the mobile phone industry and spans across the entire Mobile Internet supply chain. Its goal is to increase market growth.

Ericsson is one of almost 200 companies that has joined OMA. Its mission is to increase interoperability regardless of mobile service, market, operator or terminal. OMA will specify standards for all parties involved and is the most comprehensive collaborative body to date. Initially, it will unite previous initiatives such as WAP Forum, Wireless Village, SyncML and the Location Interoperability Forum (LIF).

"Ericsson has always been a driving force when it comes to open standards and we have already accomplished much within existing collaborative bodies. OMA is unique in that it encompasses the entire Mobile Internet supply chain, making things easier for everyone from system suppliers and content developers to end users," says Torbjörn Nilsson, senior vice president for Marketing and Strategic Business Development at Ericsson.

With OMA, applications can be created in a more cost-effective manner and in ways that allow them to work together, enabling those who sell terminals and systems to shift their competitive focus to design and functionality. Application and content developers can utilize the same interface regardless of network, and IT and software companies will benefit from economies of scale and global access to application developers.

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Attractive new products from Sony Ericsson

With the launch of several new products just one day before CommunicAsia, Sony Ericsson is hoping to once again shake up the market.

Stefan Streit

"This time, we are delivering products aimed at the middle segment of the market," says Stefan Streit, vice president of Global Product Marketing. "The bulk of consumers will now be able to access pictures and entertainment on their mobile phones."

The new telephones were unveiled simultaneously at 30 locations around the world, from Singapore to Dubai.

Sony Ericsson received positive publicity worldwide when the company unveiled its first products sporting the new brand name back in March. Some critics pointed out, however, that Sony Ericsson also needed to offer less exclusive products in order to become a world leader.

That, according to Stefan Streit, is what is now occurring.

"Our first products were intended to build brand recognition. And although the T68i is a relatively expensive model, it has been a very good seller, even outside its intended customer group," he explains. "Now comes our follow-up and we anticipate selling even more of these products."

T300 with MCA-25

The clear emphasis on the use of pictures on mobile phones continues with the T300. Together with a new version of the CommuniCam (MCA-25), a new category of consumers will be able to benefit from multimedia messaging (MMS). Moreover, the T300 has a color display and polyphonic x 2 ring tones – i.e. multi-pitched x 2 ring sounds. Users can download games and have the option of switching front panels.

The powerful T600 will be Sony Ericsson's smallest mobile phone yet, while the T200 is truly an entry-level phone.

"It is small, sharp looking, has all kinds of great features and will be available on the market just a few weeks after its launch," says Stefan Streit.

T600 and T200.

The new Japanese telephones, which have been developed for KDDI and NTT DoCoMo, give a glimpse of what the future holds.

"The high quality speakers and fantastic displays demonstrate that the Japanese are one step ahead," says Stefan Streit. "However, these are also expensive phones."

The new NTT phones.

The T61d is the first TDMA telephone to bear the Sony Ericsson logo. It is an updated version of the T60. Upgrading existing Ericsson and Sony telephones to new versions with the new brand name is also an important part of the company's strategy.

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T61d

www.SonyEricsson.com

An increased focus on strong product areas, a reduction in the number of technical platforms and continuing investment in the growing service market.

These are some of the components in the strategy document that will serve as the foundation for long-term work within Ericsson.

A new plan for the future

The weak growth of the industry has led management to prepare a new strategy document. This does not mean that all of Ericsson's strategy has been changed; fundamentally, the same values and the same objective – to be the leading supplier of solutions to telecom operators and service providers – remain.

The last time that Ericsson issued a revised strategy in printed form was two years ago. A great deal has happened in the market since then.

Above all, the operators have stopped increasing their investments for the time being. During the latter part of the 1990s these investments in new infrastructure increased by 20 to 30 percent per year. This year, the operators on the whole are reducing their investments.

Operators have problems

This is largely due to the burden of debt under which the operators are suffering, with the sky-high fees paid for 3G licenses being a contributing factor.

The consequence has been that customers have been forced to pay off their loans, instead of investing, which they in many cases should be doing in order to maintain quality and service.

These new conditions naturally affect Ericsson, and the new strategy document points to some partially new ways forward.

To begin with, it is made clear that Ericsson has four core areas: systems, services, terminals (with Sony Ericsson) and licensing operations. The latter include patents, mobile platforms and Bluetooth – all of them successful ways of earning money on the company's large portfolio of intellectual properties.

Greater emphasis on product life cycle

A key element in the strategy is a clear plan specifying which products and technologies to focus on and which to gradually phase out. This will ensure that resources are used in the best way. It means that each product is to be positioned relative to a life cycle. This cycle has four phases: investment, harvesting, maintenance and exit.

The products of the future that the company must invest in and develop are in the first phase. The second phase contains products that are mature and profitable, but where the greatest part of the development work has been done.

When a product begins to age, it moves to the maintenance phase. It then becomes a matter of keeping the product alive. Finally, products that do not measure up are simply liquidated.

"We have to focus on and invest in third-generation systems, and that means both mobile and fixed-line networks," says Torbjörn Nilsson, senior vice president, Marketing and Strategic Business Development at Ericsson. "In category two, there are second-generation systems – that is, many of today's systems – while parts of PDC and TDMA are examples of products that are entering a maintenance stage and are becoming a service business."

"The measures that we are taking will result in our concentrating to an even higher degree on what we do best and what earns money for us and our customers.

Along with third-generation systems, services are designated as the major sector in the revised strategy.

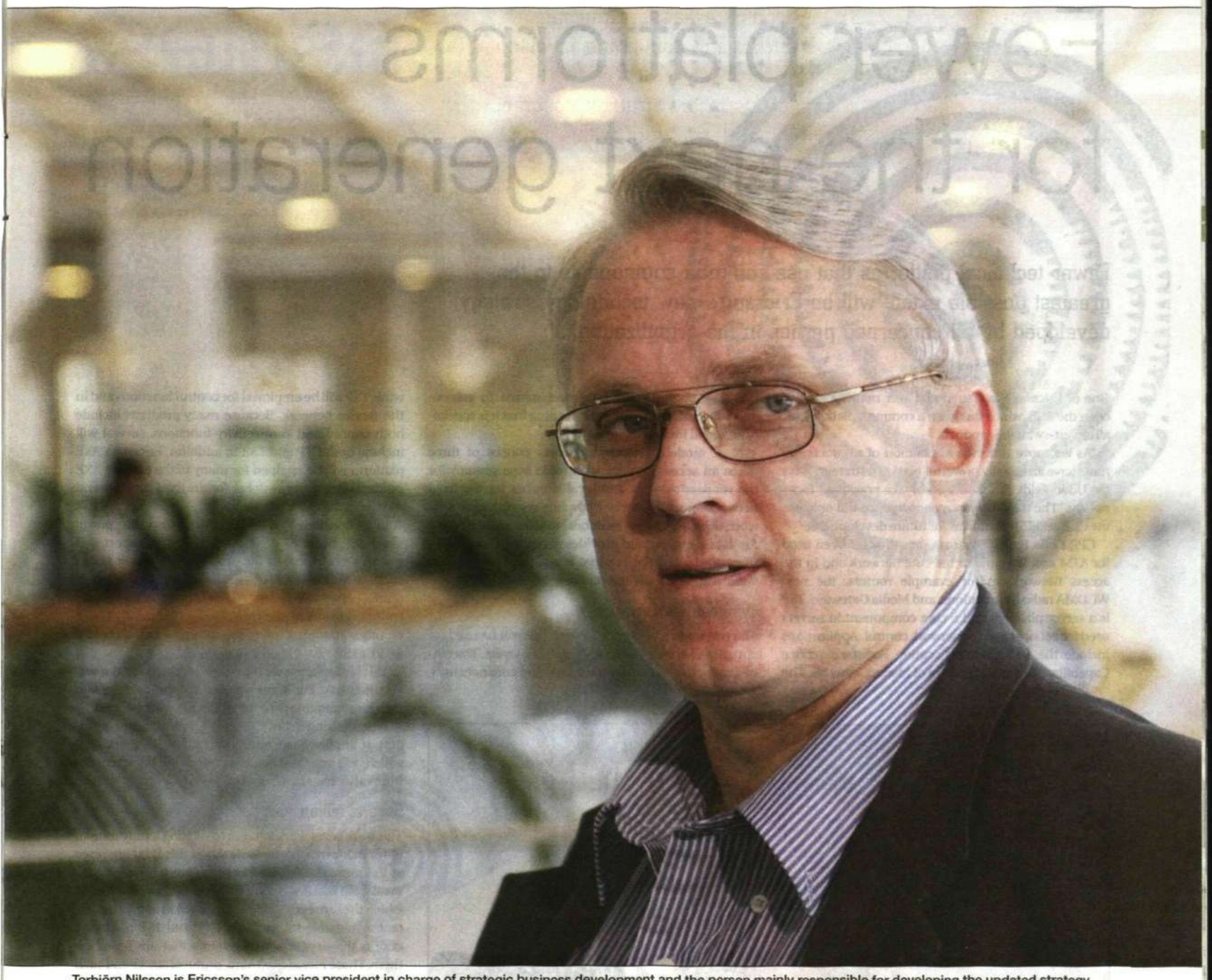
"We will continue to concentrate on services that yield added value for the customer and we will increase our offering in this area so that it covers a larger part of the value chain," Torbjörn Nilsson says. "This applies in particular to two areas: integration services, in which we provide consulting and integration services to integrate customers' networks; and operating and maintenance services, in which we assume responsibility for operating all or part of a customer's network, with Ericsson products. This is an important growth market and already accounts for nearly a fourth of our sales. We think that the percentage can increase."

Ethernet for households

Within the framework of the coming generation of telephony systems, which are characterized by packet data and possibilities for multi-service solutions, Ericsson will also focus on broadband access.

"Broadband access will be an important growth area," Torbjörn Nilsson says. "We intend to introduce a new technology that is both less expensive and offers greater possibilities than the present ADSL, and which is based on Gigabit Ethernet technology. We are thereby partly changing the playing rules. The technology is cheap and is designed for both households and companies; it is also a method of improving the quality on the transmission network by moving it closer to the customer. We are now entering an exciting and important field."

In addition to knowing where a company must focus, it is also important to make clear from which areas it



Torbjörn Nilsson is Ericsson's senior vice president in charge of strategic business development and the person mainly responsible for developing the updated strategy.

PHOTO: ROLF ADLERCREUTZ

should withdraw. If a company cannot be among the three largest in a field, a product should be terminated.

Stricter sales requirements

"A company simply has to have a certain share of the market in order to be profitable," Torbjörn Nilsson says. "If we are not large enough in a market segment, we can't be successful, and we should then withdraw. There is nothing new in this strategy. We have pursued it for quite a while but we have not been good enough to measure up to it. Products that were unprofitable have been allowed to remain too long because we have been doing so well in other areas. We can't permit that today.

"This means that there are a number of areas that will be looked at closely. The basic concept is that if an operating area cannot show a strong position or possibilities for improvement within approximately three years, we must get out."

The stricter product prioritization that is now being introduced will lead to a concentration of development and research resources in fields that are most important strategically. The building blocks in system architecture that are known as platforms are also being overhauled. In the expansive atmosphere of the 1990s, the number of platforms was also allowed to swell. Forceful measures are now being taken to correct this.

"Reducing the number of platforms is our most important task, along with introducing product life cycles. There are too many platforms today, and the number is to be reduced to three: two platforms for packet data in core networks, along with them, AXE for telephony. This program is exceptionally important since the number of platforms determines our costs for products, research and development."

But, to repeat, the basic objectives of the strategy remain the same.

"It is thus not a matter of a new strategy," Torbjörn Nilsson says, "but rather of our focusing even more sharply, and of sticking even closer to what we have already said. The restructuring of the market and the consolidation we see where our customers – operators and service providers – are concerned, constitute a trend that we foresaw eight or ten years ago. So I say that it was not the analysis of the market and the strategy that were wrong, but rather our way of acting on them, and our speed in changing, based on conditions in the outside world. But the measures that we are taking, and which I have described, will result in our concentrating to an even higher degree on what we do best, on what is important and what earns money for us and our customers."

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Fewer platforms for the next generation

Fewer technical platforms that use common components to the greatest possible extent will be Ericsson's new technology strategy, developed by all concerned parties in the organization.

One of Ericsson's key strengths over many years has been the AXE, which has been a common platform for all circuit-switched products.

"As we move to a new generation of products, we must have an equally powerful platform strategy," says Jan Uddenfeldt, Ericsson's senior vice president, Technology. "The new strategy means that we will only use the CPP and TSP platforms for future development."

CPP, Cello Packet Platform, has thus far been used for ATM and IP traffic in the core network and in the access network, in for example routers, the new WCDMA radio base stations, and Media Gateways. TSP is a server platform and a core component in servers used for services and for network control. Applications include the HLR (Home Location Register), Service Capability Servers and control of Media Gateways. The new TSP platform employs mechanisms to achieve telecom grade performance, meaning that it is specially designed for high reliability.

Most modern telecom networks consist of three parts: an access network with radio base stations for the wireless network and local switches for the fixed network and the interface towards users; a core network, which includes switches, routers and gateways for data transport and provides network control functions; and a layer above that is a service network for various applications and services.

Two main platforms

The two main platforms CPP and TSP will be used for virtually all applications on these three layers. The emphasis for CPP will be on the access and core networks, while TSP will be employed for control functions and in the service network. Because many products include both control and connectivity functions, several will include both CPP and TSP. In addition, Ericsson's AXE platform will be retained for many of the existing AXE products, primarily switches for the fixed network and mobile switches.

In the core network, TSP will thus be used for control functions, while CPP will be used for transport and connectivity, meaning for connection to other nodes and networks via Media Gateways, for example. In addition, networks will provide full IP support based on a common software platform. Products currently based on other platforms will in the future be based on CPP and/or TSP.

TSP is also being used for new products for the service network. For some servers, a simplified version with lower requirements on availability will be used.

When talking about CPP and TSP in all future products, it implies forthcoming versions of CPP and TSP, which will use and include valuable characteristics from other platforms.

Several advantages

There are several advantages to making a transition to fewer platforms, particularly when this is taking place at the same time as development work is moving toward what is called a component-based architecture in which the same components are used to as great an extent as possible for the AXE, CPP and TSP platforms and in the products and systems that are based on them. These include software, protocol stacks and such hardware as GEM (Generic Ericsson Magazine), interface cards, processors and switches.

The greatest advantage of a common platform strategy lies in costs for deployment, installation, training and the administration of Ericsson products.

The choice of CPP and TSP also ensures future-proof products and systems because they are open platforms that utilize commercially available hardware and software. This makes them highly flexible and allows them to remain at the forefront of technology.

"The new platform strategy is just as much a part of the rationalization of our operations as the concentration of R&D centers," says Jan Uddenfeldt. "Ericsson's Core unit Core Network Development (CCND) will be responsible for managing and developing the platforms. CPP is already being rolled out in 3G networks, and TSP, which is also available today, will be released in a simplified version during the year."

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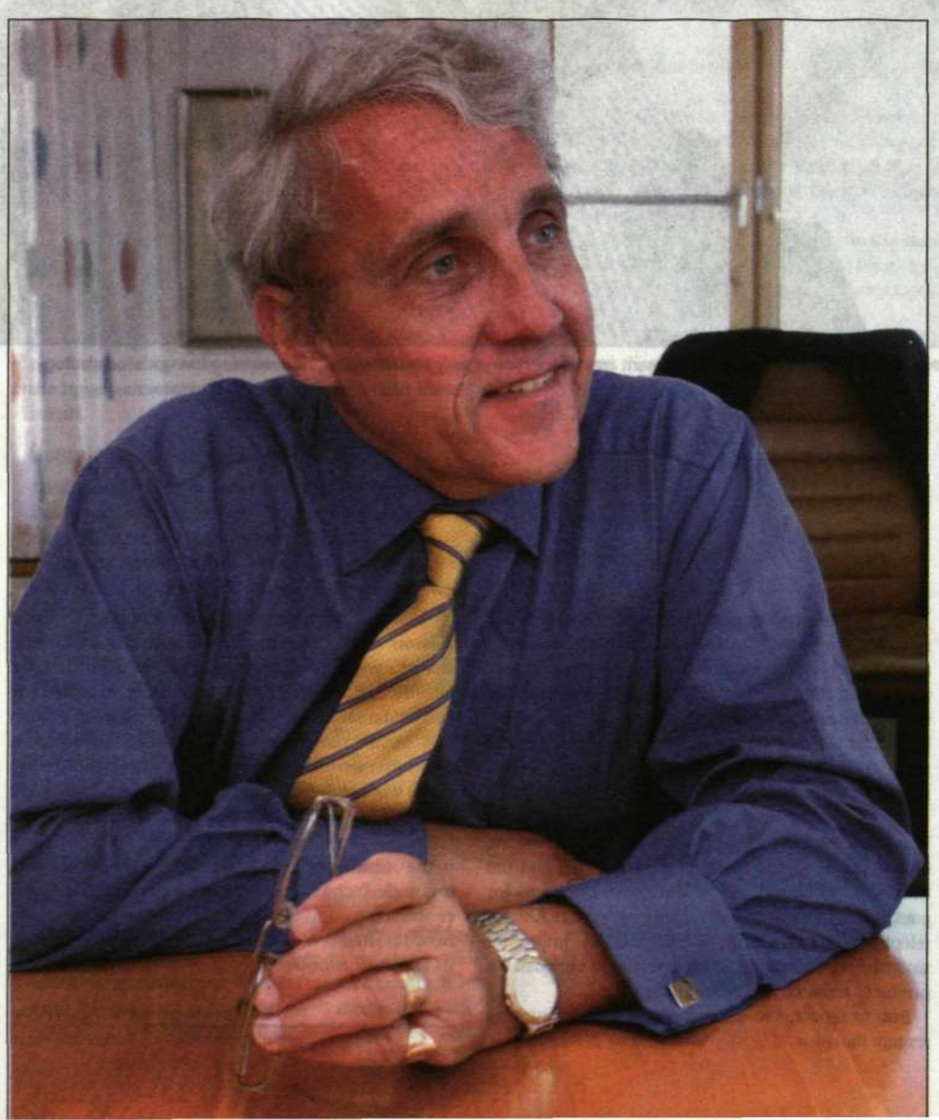

"We will focus on the CPP and TSP platforms for future development," says Jan Uddenfeldt, senior vice president, Technology .

PHOTO: ROLF ADLERCREUTZ

ILLUSTRATION: SYSTER DIESEL

FACTS ERICSSON'S STRATEGY

Ericsson's strategy is the foundation for all the company's business. It specifies the goals Ericsson strives for and how management plans to achieve them. The strategy presented here is an updated version, but the basic foundation remains unchanged.

Here are the most important ingredients:
Ericsson's mission: To understand our customers' opportunities and needs and provide communication solutions faster and better than any competitor.
That way, Ericsson can generate competitive financial profits for its shareholders.

Ericsson's core values: Professionalism, respect and perseverance.

Overall long-term goals: To be the telecom industry's leading supplier of solutions for operators and related service suppliers.

Do you want to know more about Ericsson's strategies?
More information is available on the **intranet** for those who want to learn more about Ericsson's strategies.

The Strategy site contains a great deal of information, including a presentation that describes the main point of the strategies, puts them in a business perspective, and shows how they relate to Ericsson's overall goals, vision and values.

Soon a Web course will be offered, entitled **Learning Strategies** for those who want to know more about the thinking behind the strategy.

inside.ericsson.se/strategy

Marketing intensifies with sales expertise

Increased expertise within the sales organization and more efficient collaboration with customers are two ingredients in the plan for how Ericsson's marketing will intensied.

Peter Olson is responsible for developing Ericsson's marketing strategy. Among other things, the strategy involves a further refinement of the company's focus on its most important customers.

PHOTO: LARS-MAGNUS KIHLSTRÖM

Two years ago, one new operator came on the scene every week. Now, operators are exiting just as quickly. It is a telling illustration of the current state of the telecom industry.

Major changes were made in the marketing organization last year. Among other measures, markets were combined into larger units. Ericsson's new strategy continues along the path towards a more efficient sales organization.

That means a greater focus on the leading global operators and service providers.

Ericsson currently has a large number of customers of various sizes and types. Several are global or regional powerhouses that serve large areas and millions of subscribers. However, Ericsson also has a great many smaller smaller customers in the 140 countries where the company operates.

A number of these will be served in a different manner in the future.

"The major global, regional and local customers are given highest priority. But we also work with quite a few smaller customers and we must not abandon them. In that area we must review how we operate. We can't operate with a system of large account organizations for every customer. Instead, we need to utilize and develop alternative work methods and channels that result in greater efficiency for both us and our customers," says Peter Olson, who is responsible for developing the marketing strategy.

As an example, Peter Olson mentions how some services for smaller customers could be handled over the Internet. Another method is to offer more standardized products that result in more efficient customer service.

In the future, customers must be managed at least part of the time via the Internet.

Vodafone a good example

The Internet has already been successfully utilized in conjunction with the global customer Vodafone. This experience will now serve as an example for work with other large customers.

Ericsson and Vodafone have established a joint portal on an extranet. In addition to enabling the operator to place suborders and recurring orders via the system, it also serves as a tool for project work. It enables the creation of virtual working groups with members from both companies, situated on different continents.

"Ultimately, it allows the most critical resources to be focused on important matters. One of the customer team's most important tasks is to generate new sales and promote relationships with customers. This is best accomplished through face-to-face contact. But for routine tasks there are better tools. If they involve suborders or recurring sales, it is more practical to use the Internet," says Peter Olson.

Not only is this a more cost-effective way of working, it can also result in closer relationships with customers, which has been the case in the partnership with Vodafone.

"Due to the fact that we are actually creating a common workplace for both our employees and our customers, collaborating on certain issues becomes easy and we see that we are actually bringing customers closer to us, which is a positive thing," says Peter Olson.

"This method does not suit all of our customers. But it works for many, especially global customers, and we must move in that direction."

New challenges

One of the most important points in the strategy is Ericsson's expanded role in the supply chain through an emphasis on service products.

Ericsson is making a clear move away from being a supplier to also being an integrator of networks and offering consulting services to build and plan customers' networks, as well as oversee network operation and maintenance. This strategy should be implemented even as the company maintains its strong position as a supplier of infrastructure. For Ericsson's organization, this involves new challenges.

"It is obvious that there is a significant amount of potential within services, and that puts demands on skill development within our customer teams. For one thing, there are certain skills that are required in order to be able to appreciate customers' needs and to be able to demonstrate the savings that can be realized by taking advantage of our service offerings, compared with simply selling a system or a product. We are expanding the expertise that we have. We already have significant expertise within Global Services and now we are continuing to develop that within the market units and customer teams," says Peter Olson.

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Supply and IT reorganized

In order to clarify areas of responsibility and avoid work duplication, Ericsson is consolidating its various supply functions into a single unit – Core Unit Supply. And from now on, the IT unit will report directly to the company's Chief Operating Officer Per-Arne Sandström.

Ericsson is combining its various supply functions into Core Unit Supply. Björn Boström, who will continue to oversee the unit, sees only advantages with the new arrangement. He believes the company will obtain much more clearly defined areas of responsibility when it comes to supply, and that work with business units will become more efficient.

PHOTO: ROLF ADLERCREUTZ

The merger of the Business Units Mobile Systems and Multi-Service Networks into Business Unit Systems has demonstrated that there is a need for more clearly defined responsibilities within Supply & IT, in order to better fulfill the needs of the new business unit structure. Consequently, Ericsson's management has decided to concentrate all responsibility for Supply within Core Unit Supply and dissolve the corporate function Supply and IT.

"This concentration means that employees from business units and market units will be transferred to Core Unit Supply. That makes it unnecessary to maintain a corporate function," says Björn Boström, who will continue to oversee Core Unit Supply.

He sees only advantages with the new arrangement.

"In the past, the division of responsibilities resulted in unnecessary duplication of work. Now we will have a single Supply Chain manager responsible for the entire supply chain for each product line in accordance with the new business unit structure."

As a result, Core Unit Supply will be responsible for the entire supply chain, from the time orders come in from customers until products are ready for acceptance (in operation at a satisfied customer's location). In addition to the Supply Chain manager function, new units will be formed within Core Unit Supply with responsibility for handling orders, setting requirements and planning. Areas that will not become part of Core Unit Supply include the former Corporate areas Real Estate, Sustainability and Environment, and IT.

The biggest change for these areas is that IT, overseen by Håkan Liedman, will now report directly to Per-Arne Sandström. One of the reasons for this is that Ericsson's SAP business system, which will soon be widely implemented throughout the company, is based largely on IS/IT issues. It is therefore natural that Per-Arne Sandström, who has overall operating responsibility for installation of SAP, needs to have better control over IT operations.

"There is tremendous potential for increasing efficiency within Ericsson when it comes to IS/IT, but it is essential that the entire company keep up with shared processes and tools," says Per-Arne Sandström.

"My role as COO will not change because of this. On the other hand, I will be taking on one more area to which I will be devoting a significant amount of time and energy in order to understand and ensure that what the company needs is delivered."

Per-Arne Sandström

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DATES CHANGES UNIT BY UNIT

The **Supply & IT** corporate function will cease to exist. Effective June 1, all Supply operations will be consolidated into Core Unit Supply (CSUP), led by Björn Boström. Some of the former Core units will also be absorbed into CSUP, while others will not.

Corporate Supply will move to CSUP and serve as the foundation for a new function, Supply Chain Development, headed by Lars-Göran Hansson.

Global Inventory Management will move to CSUP and be integrated with a new supply function, Planning, led by Karin Mallmin. Bo Westerberg, who was previously responsible for Global Inventory Management, will now become head of the Supplyability (requirement specification) function within CSUP.

Corporate Operational Development & Quality will move to CSUP. Rolf Broström will continue to oversee the unit.

Corporate IT will move from Supply and in the future report to Per-Arne Sandström. Håkan Liedman has overall responsibility for IT.

Corporate Real Estate, managed by Ulf Nyberg, will move to the corporate function Finance. This means that Real Estate management will, from now on, report to Sten Fornell.

Sustainability and Environment will move to the Marketing and Strategic Business Development corporate function. Managing the unit is Lars Göran Bernau, who reports directly to Ulf Pehrson, head of Public Affairs and Regulations.

The **Projects** unit, which is managed by Michael Mattisson, will be dissolved. Michael Mattisson will become head of SCM, Supply Chain Management WCDMA.

What is the next strategic step?

Developing Ericsson's overall strategies is only one part of a larger process. During the next phase, these goals and strategies will be implemented throughout the organization's work routines. Chief Operating Officer Per-Arne Sandström will oversee this work. The timetable for implementing the strategy is as follows:

During the month of June, the managers affected will receive guidelines that describe how the process will be implemented from a practical standpoint. Not every unit will be developing its own strategy. Instead, local plans for business, marketing and customer relationships will be drawn up based on Ericsson's strategies. These local plans should be done by the end of September. During the last few months of the year, every unit will then establish goals for 2003 with the help of a tool called Balanced Business Scorecard. Activity plans will be created to ensure that goals are met. Goals and action plans at the unit level will also be broken down into individual goals and action plans.

Read more about how these updated strategies will be implemented in the next issue of *Contact*, which will be published in mid-August.

LARS-MAGNUS KIHLSTRÖM

PHOTO: LARS ÅSTRÖM

Microelectronics sold off

Ericsson is selling Microelectronics to Infineon Technologies AG of Germany. The deal, worth an estimated SEK 3.6 billion, approximately USD 360 million, is expected to be completed by midyear. The buyer is one of the world's largest manufacturers of semiconductors for communications and other applications.

"The deal is part of both ours and Ericsson's long-term strategies. It was both logical and essential that Microelectronics join forces with a larger partner whose core operations were the same as ours. Infineon has the economy of scale, the resources and the product portfolio required for us to retain the lead in this area," says Bo Andersson, president of Microelectronics.

Infineon Technologies will be assuming control of products, research and development, component design, manufacturing, production equipment and 700 of the approximately 1,400 employees. Units affected are located in Stockholm and Linköping in Sweden; Morgan Hill, Dallas and Philadelphia in the US; Swindon in the UK; Emmen in the Netherlands; and Hong Kong and Shanghai in China.

Infineon's operations in Sweden will be renamed Infineon Wireless Solutions Sweden.

Employees at the two silicon wafer plants in Kista, and the administrative and support functions behind that production, are not included in the deal and will remain a part of Ericsson. Operations will continue to be staffed by Ericsson employees over the next year or two, but will be overseen and run by Infineon through a leasing arrangement. The approximately 600 employees who will remain at Ericsson will become redundant as production is eventually transferred to units within Infineon's global organization. The name of the transitional operation will be Ericsson Micro Components.

"The decision to phase out our production units was a difficult one. It is a development that we did not desire, but which is unfortunately unavoidable regardless of the scenario. Overall, it is a very good agreement that benefits both Ericsson and Microelectronics, as well as Infineon," says Bo Andersson.

He says that Ericsson Microelectronics customers will find a significantly stronger supplier in the future with greater resources in all areas.

Ericsson's Chief Operating Officer Per-Arne Sandström, describes the sale as a natural step in the company's effort to focus on its core operations.

"The sale to Infineon means that Ericsson will continue to have a strong partner and supplier for a host of important products, and that we will be able to ensure delivery of components for our systems," he says.

He emphasizes that a decision regarding the future of the two manufacturing units in Kista is not directly linked to the fact that Infineon is the buyer of Microelectronics.

"Regardless of the sale to Infineon, we would have either been forced to make major investments or gradually wind down operations. Such a minor player as Microelectronics would not have been able to support investments on the scale that we are talking about here," says Per-Arne Sandström.

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Invisible mobile will drive the market

Communication between mobile phones is far too limited. The real opportunities for growth are in the "invisible mobile", according to a new report by analyst Lars Godell of Forrester Research.

How will operators increase their revenues in the future? This is a question that the entire industry has been pondering during recent years. Most believe that the future lies in mobile data and this is certainly true, but it is hardly mobile data via mobile phones that will pay the operators' GPRS and 3G investments in the short term. At least, not if analyst Lars Godell of Forrester Research is to be believed.

Lars Godell

"We estimate the average revenue per user (ARPU) for voice traffic will decline by 36 percent between 2000 and 2005. Revenue for data via mobile phones will not grow quickly enough to offset this decline," he says.

At the same time as ARPU is declining in the developed parts of the world, the number of mobile subscribers in those areas is growing only slightly. In Europe, for example, the number of mobile-equipped citizens will level off this year, according to Forrester Research.

New growth engine

The new growth engine, according to Forrester Research, is "invisible mobile." There has been much talk of "machine-to-machine" (M2M), meaning communication between machines.

"But this is not quite the same thing," explains Lars Godell. "Invisible mobile is about connecting more than just machines. It also connects chips, plants, buildings and goods. The main point is that people are not involved."

Forrester's report – "Invisible mobile reignites mobile telecom" – explains that the transition to invisible mobile will occur gradually over the next 20 years. By 2005, there will already be more connected objects than connected people, but the difference in the number of sessions is even more striking.

A traveling executive may make calls and send messages a dozen times a day. The executive's car could easily participate in 100 small GPRS sessions, such as downloading route plans, sending pre-emptive maintenance information to an eventual leasing company or sending mileage data to tax authorities.

Mobile operators can find new revenue possibilities by helping to build and maintain private invisible mobile networks in cooperation with systems integrators.

Large profits

But who will pay? The answer to this question is everyone who can make their operations more profitable via invisible connections.

An example is Coca-Cola, which misses out on 7 percent of sales every day because stores run out of its products. If the company uses smart tags on cans and bottles, the store shelves will always be well stocked, while other gaps in the delivery chain will decline.

But isn't it true that the mobile industry can still grow by attracting more subscribers? Far from all markets are saturated.

"I don't think that would be sufficient. There are lots of economic, cultural and political risks involved. The industry does not have the patience to wait for any such investments to pay off. Many of these countries have not yet achieved an economic level where they can generate large revenues per user," concludes Lars Godell.

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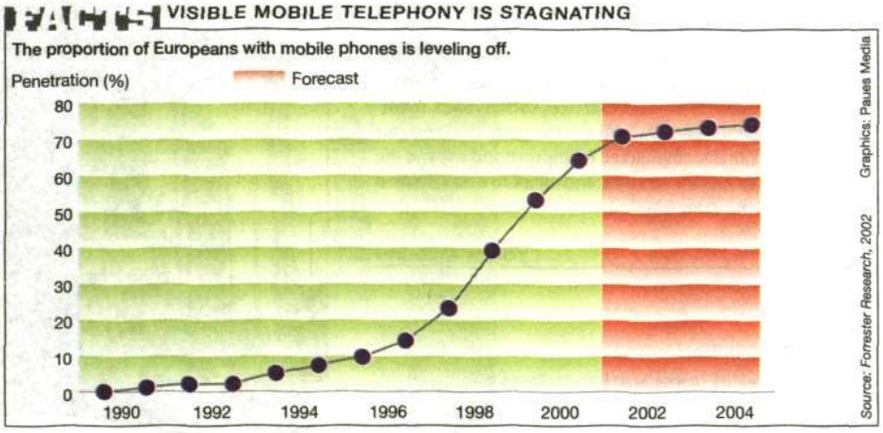
FACTS INVISIBLE MOBILE

- Uses such technologies as GPRS, Bluetooth, W-LAN and RFID (Radio Frequency Identification), which require little spectrum. (More information on RFID at www.rfid.org)
- Can expand limitlessly. Imagination sets the limits.
- Has a low cost.
- Favors service companies, such as Accenture and IBM, equipment vendors such as Ericsson (has many patents in the area of "invisible" technologies, including Bluetooth) and mobile operators.

FACTS VISIBLE MOBILE TELEPHONY IS STAGNATING



Despite everything, the number of people is limited. Forrester estimates that the proportion of mobile users will level off at 80 percent in most countries. Europe will soon reach this level.

Strategic step backwards for NTT DoCoMo

NTT DoCoMo has launched its first 2G telephone with a camera. The whole project is regarded as a strategic step backwards aimed at reducing the number of subscribers who are switching to KDDI and J-Phone, according to news website totaltele.com.

The new phone, designated SH25i, is made by Sharp and is a PDC phone with MMS capabilities. The intention is to match J-Phone and its Sha-Mail service. It is believed that Sha-Mail has captured subscribers from the target group for DoCoMo's FOMA 3G service. This is because Sha-Mail is less expensive and has better coverage.

Mobile sales forecast lower

Mobile sales will be lower than previously expected both this year and next, according to the Merrill Lynch investment bank, which has reduced its forecast for 2002 by 6 percent (to 385 million phones) and for 2003 by 11 percent (410 million phones). Naturally, Nokia – number one in the world for mobile phones – will be worst affected.

According to the bank, Samsung and Siemens are Nokia's largest competitors. Nokia has also lowered its sales forecast for the second quarter of 2002 by between 2 and 6 percent.

One in three will have a 3G phone in 2007, according to new forecasts from WMRC.

"One third will use 3G in 2007"

By the end of 2007, about one third of all mobile users in Western Europe will own a 3G phone, according to the latest forecasts from the World's Market Research Center (WMRC). The institute estimates that 85 percent of the population in Western Europe will own a mobile phone by that time.

Revenue from 3G is expected to amount to slightly more than a third of all mobile revenues. The WMRC's figure is 15 percent lower than the one published by the industry's UMTS Forum in August 2001. The WMRC's estimate of penetration is also lower than other figures published, which spoke of penetration of about 40 percent by the end of 2007.

www.wmrc.com

3G development monitored on intranet

What is the current status of the 3G market? There is comprehensive monitoring of the 3G status on the BIC portal on the intranet.

The Global 3G Report was compiled by Equity Research. When you enter the BIC portal, you can find the report on the right under the New External Reports heading.

bic.ericsson.se

Cultural diversity inspires

With 12 countries, 160 million inhabitants, more than 16 languages and a multitude of cultures and traditions, the Middle East is anything but a homogenous region. It is no less diverse from a telecom perspective; mobile penetration varies from 3 to 57 percent, depending on which country you are in.

Cesare Avenia heads market unit Middle East and he finds the region unique.

"It is often said that the Arab world is something uniform and homogenous, but this is not the case. There are so many different cultures and values, which is of course an inspiring challenge for Ericsson," he states.

The variation is also noticeable when it comes to telecom. As an example, Cesare Avenia mentions that while the United Arab Emirates is about to begin the rollout of 3G, the possibility of roaming does not even exist in Iran. Everything is happening at the same time and it happens rapidly. This requires specially adapted strategies.

"I visited Saudi Arabia for the first time in 1999 and I couldn't even access my voice mail there. Since then, we have developed the infrastructure and created one of the best networks in the world," says Cesare Avenia.

Cesare Avenia

"Growth is tremendous in these countries. We must continue to remedy the fact that so few have access to telephony, but, with each new launch, we notice that there is huge interest in the most advanced solutions."

In general, the operators in the Middle East are still regulated, but deregulation is fast approaching. Cesare Avenia is convinced that both the customers and the operators are ready for this step.

"The operators here are extremely interested in finding out about our experiences. For example, we have discussed the licensing failure in the West, and I am confident such mistakes will be avoided here. They have also been very cautious in their approach to 3G and have moved one step at a time."

Having government-regulated operators in a somewhat turbulent region inevitably leads to politics becoming a part of daily life, as cooperation with operators means meeting with government representatives. Cesare Avenia admits that a careful balance is important.

"We discuss everything from multimedia messaging services, MMS, to infrastructure and strategy, and we are pleased to somehow function as a link."

Ericsson's market dominance in the area is undisputed, with 44 percent of the wireless sector and 33 percent over all. The nine local companies operate in twelve countries and business is going well.

"Our strength lies in our local connections and close cooperation with the operators. We have built up a reputation of solid credibility which we are very proud of," says Cesare Avenia.

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As part of the marketing effort liked to the Mi2U competition, a treasure hunt was recently organized in Beirut, where participants used instructions from WAP phones to move between various check points and answer questions about the city. PHOTO: MERWAN ASSAF

Successes to be found in young market

Iran has the largest population in the Middle East, but the lowest mobile penetration. The Iranian government is now planning to deregulate the market to create momentum for mobile services. This combination makes for an explosive market potential.

In Iran, roaming and SMS are not yet available. Only 3 percent of the population use a mobile telephone and mobile telecommunication is still in its infancy.

"The Iranian market is unique in many ways. It's monopolized, so there is only one operator active in the market. Also, it can be difficult to bring in staff or partners from abroad due to immigration, taxation, and security issues," says Jeff Travers, Ericsson's country manager in Iran.

Ericsson's Iran branch office was established ten years ago and since then, it has acquired a leading role on the Iranian market. The breakthrough came two years ago, when the national operator TCI contracted Ericsson to expand Tehran's GSM network. Infrastructure serving about 1.2 million subscribers is now installed, but further investments are needed.

More than 10 million people live in the crowded and constantly expanding city, and congestion is not only experienced in the bustle of the streets, but also in the over-taxed GSM network, and TCI is now planning a further expansion. However, a nation-wide GSM expansion will be completed first, and Ericsson is one of three suppliers that are currently competing for the contract.

"We've been building our GSM relationship with TCI over the last two years, and today we're one of the top suppliers. If this contract goes through we will have a strong if not majority position in GSM infrastructure here," says Jeff Travers.

Today, TCI reigns supreme in the Iranian market, but the Ministry of Information and Communication (MICT) is planning a deregulation as one way of raising mobile penetration to 15 percent by the year 2005. Jeff Travers believes that these ambitious goals can only be realized if fresh resources are brought in.

"Right now we're preparing to become a main partner for new entrants in the market by strengthening our local presence and increasing the skill of our staff. We're also investigating the possibility of cooperating with subcontractors and local partners that can help us with the expansion.

Rollout of GSM infrastructure in greater volumes is the most pressing need today in Iran, but another important issue is the introduction of new services such as SMS, roaming, and Mobile Internet. And this is the great challenge for the players in the Iranian market: to improve and expand the network, introduce new services, and adapt to a deregulated market – all at the same time.

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Jeff Travers, country manager in Iran, believes that deregulation of the country's telecom market could be fruitful.

PHOTO: SONNY THORELLI

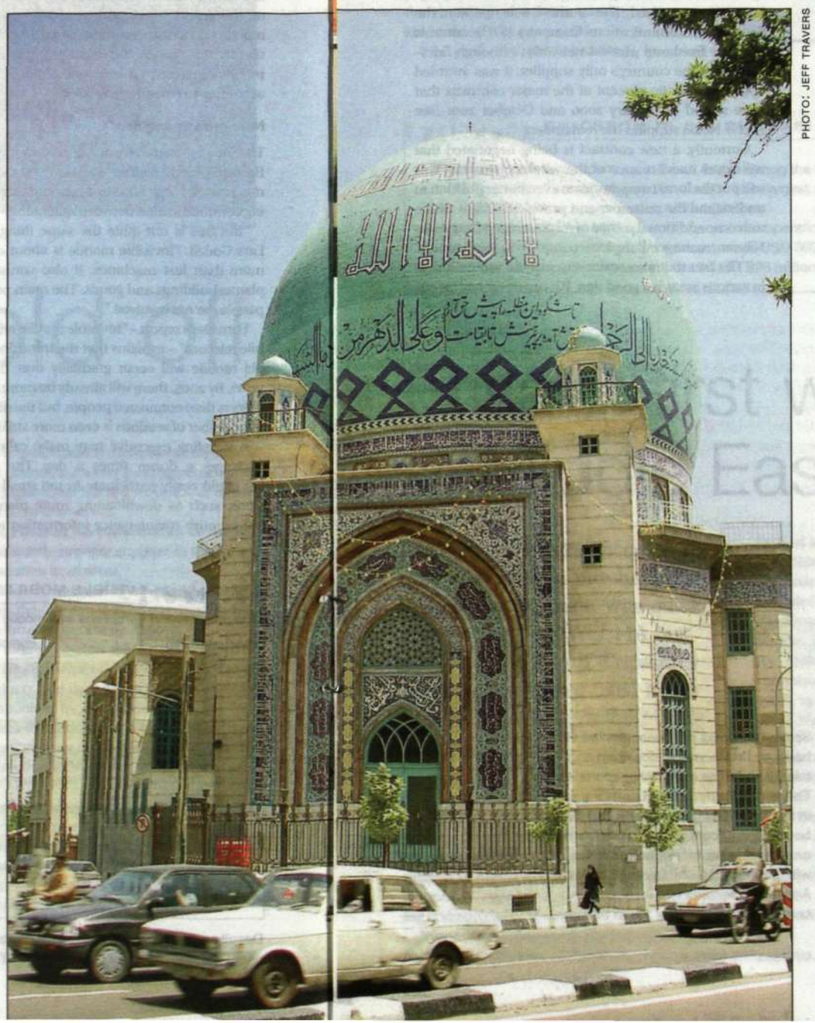

PHOTO: JEFF TRAVERS

Mobile Internet the Lebanese way

Tourist guide, traffic information, calorie counter. These are some of the bright ideas Lebanese students have come up with as they compete for Ericsson's award for the best mobile application. The prizes include both trips and mobile phones.

In Lebanon, 20 percent of the population use a mobile telephone. Now efforts are being made to increase interest in the Mobile Internet and to find new, creative ideas about how to apply it in Lebanon, through a contest named Mi2U (Mobile Internet Initiative to Universities). The target audience is business and engineering students at Lebanese universities.

"Young people are the driving force behind this development. They are the future decision-makers, partners and customers, so it is important to increase awareness of the Mobile Internet in this group," says Chafic Chaya, market communications manager at Ericsson in Lebanon.

Chafic Chaya is the project manager for Mi2U, which was launched in November 2001. The task is to design innovative business concepts for the Mobile Internet, which would be suitable for launch in the Lebanese market.

Fourteen projects, dealing with everything from counting the number of calories in food to avoiding traffic jams, have been submitted by students at universities throughout the country,

"The Lebanese lifestyle revolves very much around family, hospitality and social interaction, so we believe that services involving communication, such as sharing information and entertainment, have great potential", says Chafic Chaya.

The jury, consisting of representatives from Ericsson and France Telecom, will announce two winners. The award has two parts: a package of mobile items including PDAs and GPRS telephones from Sony Ericsson, complete with subscriptions; and a trip to Ericsson Mobility World in Turkey in order to study the latest in mobile services.

The winning contributions could soon become a reality in the Lebanese market. France Telecom's local company FTML Cellis has expressed interest, but students will retain copyright over their services and will be able to negotiate with other parties if they wish.

"So far, there has been an enormous amount of interest in this project. If everything goes according to plan, it's quite possible that it could spread, with other countries holding their own Mi2U competitions," says Chafic Chaya.

TONYA LILBURN

Saudi Arabia has not been affected as badly by the economic downturn and telecom crisis as many other countries. This is due partly to the country's wealth in the form of oil and minerals, but also because the country is currently focusing on providing basic telephony service with the help of GSM. Ericsson in Saudi Arabia has secured two record large contracts from operator Saudi Telecom.

PHOTO: LARS ÅSTRÖM

No sign of telecom crisis

Employees at Ericsson in Saudi Arabia have not been affected by the telecom crisis. They are working hard to meet their customer's demand for rapid expansion of the wireless network. Two record contracts from the operator Saudi Telecommunications have resulted in enough work for the local company to keep their employees busy for the rest of the year.

The Kingdom of Saudi Arabia has entered a phase of intensive telecom development and expansion, despite the fact that deregulation of the telecom market has not yet occurred. The country's sole operator, the Saudi Telecommunications Company (STC), controls both the fixed and wireless networks. Although Ericsson is not the country's only supplier, it was awarded approximately 80 percent of the major contracts that were signed in January 2000 and October 2001 (see Facts). Nokia supplies the remainder.

Currently, a new contract is being negotiated that will cover maintenance of the wireless network. This will put the local company in an even better position to understand the customer and provide Ericsson with a welcome additional source of revenue, according to Bo Nilsson, manager of the local company in Saudi Arabia.

"The fact that we continue to expand our contracts in various areas is a good sign. We can never rest on our laurels, but must constantly ensure that we stay one step ahead of our competitors," says Bo Nilsson.

Saudi Arabia has a large need for basic telephony service, but relatively large customer groups are also starting to inquire about more advanced services based on WAP and GPRS.

"We recently helped the operator launch prepaid services, which have been very successful. During the month of March alone, for example, some 200,000 prepaid subscriptions were sold," says Bo Nilsson.

"The mobile network that we are currently building is also able to handle GPRS, so I believe that more advanced services will be deployed fairly soon, no later than the first half of 2003," he says.

Saudi Arabia has 23 million inhabitants. Just over three million of them currently have mobile phone subscriptions, compared with one million just over than two years ago. The current number of fixed line subscribers is 3.5 million, and the number of mobile phone subscribers is expected to exceed that number by the end of this year. The Saudi population has a low median age, with half of the population under the age of twenty. That means that many believe it will be easier to deliver certain kinds of new mobile services.

The goal of Khalid Al-Molhem, president of Saudi Telecom, is for Saudi Arabia to become a telecommunications leader within a couple of years.

"Our waiting list to receive a fixed line is down to 1,000 people, compared with 250,000 people just a year ago. With our new fiber optic network we will be able to implement revolutionary developments within the field of mobile services," he predicts.

Saudi Arabia has not been affected as badly by the economic downturn and telecom crisis as many other countries. This is partly due to the country's wealth in the form of oil and minerals, as well as the operator's successful focus on basic telephony services with the help of GSM.

Ericsson in Saudi Arabia has, just like other parts of Ericsson, streamlined its operations in recent years.

The company has allowed subcontractors to oversee parts of the installation of new networks and has progressively improved efficiency.

"We are working at full capacity in order to keep up with the rapid expansion of the wireless network that customers are currently demanding. I am very proud of the hard work that employees have done," concludes Bo Nilsson.

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FACTS ERICSSON IN SAUDI ARABIA

- Ericsson signed its first contract in Saudi Arabia during the 1960s
- In 1978, Philips-Ericsson signed the world's then largest telecom contract with Saudi Telecom, worth SEK 12 billion, approximately USD 1.2 billion
- In 1981, the world's first NMT network was put into operation
- In January 2000, Ericsson signed a contract worth USD 300 million with Saudi Telecom
- In October 2001, another agreement worth USD 826 million was reached with the operator

Etisalat first with 3G in Middle East

When Etisalat announced that it was interested in purchasing a 3G system, Ericsson was quick to offer a complete WCDMA test system. As a result, Ericsson's equipment is being used in the first 3G field tests in the Middle East.

The United Arab Emirates has made the most progress in the Middle East when it comes to telecommunications. The country's operator, Etisalat, is currently searching for a supplier for its planned 3G expansion, and is starting out by testing Ericsson's WCDMA network.

"None of our competitors has been able to offer a completed test system as quickly, so we have a major lead in that regard," says Bo Nilsson, who is responsible for the Etisalat account.

Bo Nilsson

Etisalat is the United Arab Emirates' only operator, and has almost two million mobile phone subscribers. Despite the monopoly situation, the company has managed to build up a competitive network, placing the United Arab Emirates at the top of the list when it comes to mobile penetration in the Middle East. Collaboration with Ericsson dates back to the beginning of the 1980s, when Etisalat was one of the first operators in the world to install digital AXE.

"We were the primary supplier of Etisalat's 2G system, and it is our goal to also be their supplier for new wireless standards such as EDGE and WCDMA," says Bo Nilsson.

TONYA LILBURN

column

BRITT SORENSEN
MIDDLE EAST COMMUNICATOR

On cows, field trails and new services

Imagine cows out to pasture, lazily grazing on a warm summer day. On the horizon you see a collection of switches doing the same. They stand there looking majestically over the field at you. At times they stir and make some sounds (the way switches do). A man from the office walks into the field and checks on the equipment, gives them a light pat and then goes back again to his office.

This is my vision of a field trial – absolutely ludicrous, isn't it? I have now learned much more about field trials and how complicated they are. Here in the United Arab Emirates, where I work as communicator for the Middle East, the operator Etisalat is getting ready for a 3G build-out, and field trials are the first step toward this.

We are honored to have the opportunity to try out our equipment tested in the operator's existing system, and we are doing our best to make it successful.

But will 3G be a hit in the UAE? Here in the market unit, we believe it will.

The UAE has very high technology standards, and mobile phones are rapidly becoming the most used communication channel for everyone, from the gardener to the executive. And my guess is they are all just waiting for new exciting 3G services to hit the market. I know I am.

Take MMS for example. If my favorite shoe store can send me pictures of their new collections, I will be there in a flash. Talk about direct marketing!

Another potential business case concerns finding your way around. I live on 26th street in Jumeira, but nobody ever wants to know my address. When I order home delivery or ask new friends to come around, I fax them a map of how to get to my house. I describe commonly known buildings on the main streets along the way and soon: Voila! Pizza or friends are at my door.

When I ask why this is still so, the answer I get is a shrug and, 'Well, this is the way we do things.'

Implementing 3G and introducing new services means I can send my position instead, a map or a video clip and so, in the future, maybe the street name won't matter at all.

It is after all not who you are that is important, but how you are connected.

Which suits me fine, actually, seeing as I never remember street names. But if you live by a farm, just send me a picture of the green pastures and there's a better chance I'll find your house.

Big hit with Swedish students

Sony Ericsson has taken a giant step into the world of Swedish universities. In collaboration with Campuz Mobile, a virtual mobile phone operator aimed exclusively at students, SEMC has increased its market share among Swedish students from seven or eight percent just six months ago, to between 25 and 30 percent today.

Students are choosy consumers. They prefer to have the latest models, they place numerous calls and are quick to adopt new functions. At the same time, they are also price conscious.

"They are a group who will have lots of purchasing power within a few years, but who currently do not have so much money to spend," explains Johan Lagerkrantz, sales manager at Campuz Mobile, who started up the business about a year ago.

From the outset, the concept involved heavily promoting a single brand. The choice was between Nokia and Sony Ericsson.

"We first conducted tests using Nokia," says Johan Lagerkrantz, "but then became hooked on Sony Ericsson. Quite simply, they had the most exciting products."

Lars Waag, head of Channel and Business Development at Sony Ericsson, says that the success is due partly to the fact that students are offered a complete package tailored to their needs – a good price on Sony Ericsson phones and laptops from Sony VAIO, discounted subscriptions through Vodafone and a reasonable payment plan.

"It has really been a huge success," says Lars Waag. "The university world can be quite a closed community, but since Campuz Mobile operates within that realm, they are able to reach students in a way that we never could."

Sales are conducted via the Internet and a major Swedish retailer, although mostly through on-campus visits to universities.

"Most of our retail sales occur on-site at the schools," says Johan Lagerkrantz. "And we've had an outstanding response. We have not received a single complaint that we are offering the wrong sort of telephones."

Lars Waag emphasizes how important students are as a consumer group. Of course, the goal is to reach them as early as possible so that they will continue to choose Sony Ericsson products once they have left school.

"They are also real trendsetters. Younger siblings and parents follow their lead, resulting in a chain reaction," he says.

Word of Campuz Mobile has even spread beyond Sweden's borders, and Lars Waag has received many inquiries when meeting with students in other countries.

"In Poland and Hungary, they are very interested in doing something similar, and here at Sony Ericsson we would very much like to eventually expand this program to every country that has a well-established university community."

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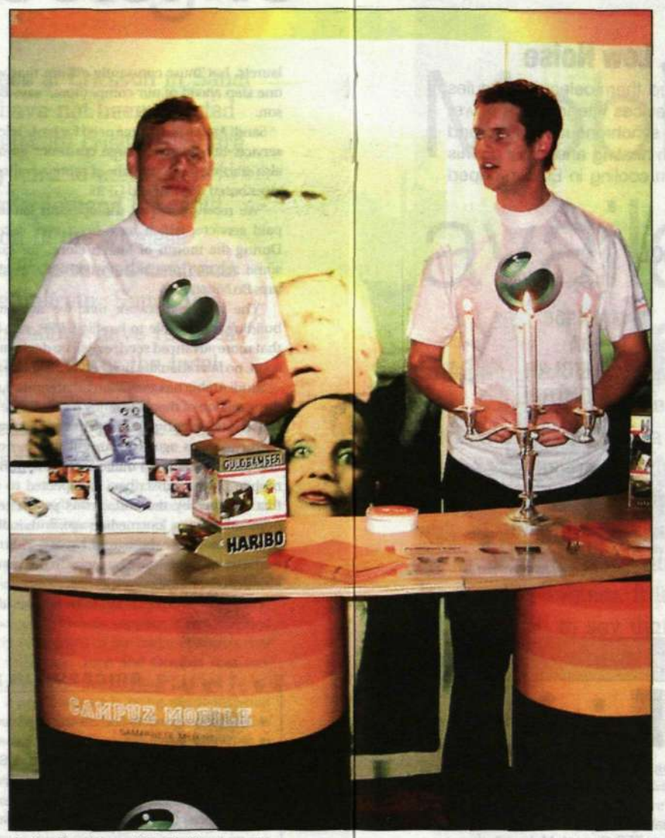

Petter Ekevärn and Martin Westermark work at Campuz Mobile. When visiting schools they wear shirts with the Sony Ericsson logo on them.

Campuz Mobile organizes numerous visits to universities around Sweden.

Sony Ericsson out to conquer world

Created in October 2001, Sony Ericsson is still in its infancy. But it is an infant with big plans. Global domination within five years is the company's anything but modest goal. To date, everything is proceeding according to plan. Break even was achieved even earlier than anticipated.

Sony Ericsson reported positive earnings during the most recent interim report. With those results fresh in mind, Sony Ericsson's global sales manager, Philip Vanhoutte, sees no reason to revise the company's impressive goal.

"Right from the start we said it and we're still saying it: Look here – you're going to see some real fireworks from this company. We're not backing down from our claim that we will become the world leader in mobile multimedia within five years."

Philip Vanhoutte

Executive Vice President Jan Wäreby believes that success is primarily the result of solid design and good applications.

"In the long term, of course, our goal is to become number one. But over the short term we have concentrated on doing everything right from the bottom up and making sure that we are able to make money. After that, we can start thinking about expanding."

Jan Wäreby explains that the goal of a larger market share shall be achieved by utilizing the various strengths of the two parent companies. He identifies three specific areas where synergies exist. The first is Ericsson's technical expertise, which is complemented by Sony's ability to create applications, content and designs that appeal to consumers. The second area is the two companies' large distribution channels. The last involves their combined geographic coverage.

"Sony adds Japan, which is an important piece of the puzzle. Not only is it a relatively large market, it is also a very advanced and highly developed market with discerning and sophisticated consumers," says Jan Wäreby.

To date, Sony Ericsson's successes have primarily been achieved by focusing on the high-end market. Soon, however, it will be time to make a push for low-end products. Jan Wäreby is careful to emphasize that their intentions should not be misconstrued.

"Just because we began by launching high and mid-end telephones, it does not mean that we are only planning on selling expensive, advanced telephones. If we are going to be the biggest player in the market, then we have to expand our offerings. We're now in the process of launching simpler and less expensive mobile phones. Before this year is out, we will have a complete lineup available," he promises.

DERMOT MCGRATH

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Two mobile phone models, the T68i (at left) and the T65, have been a big hit with Swedish students.

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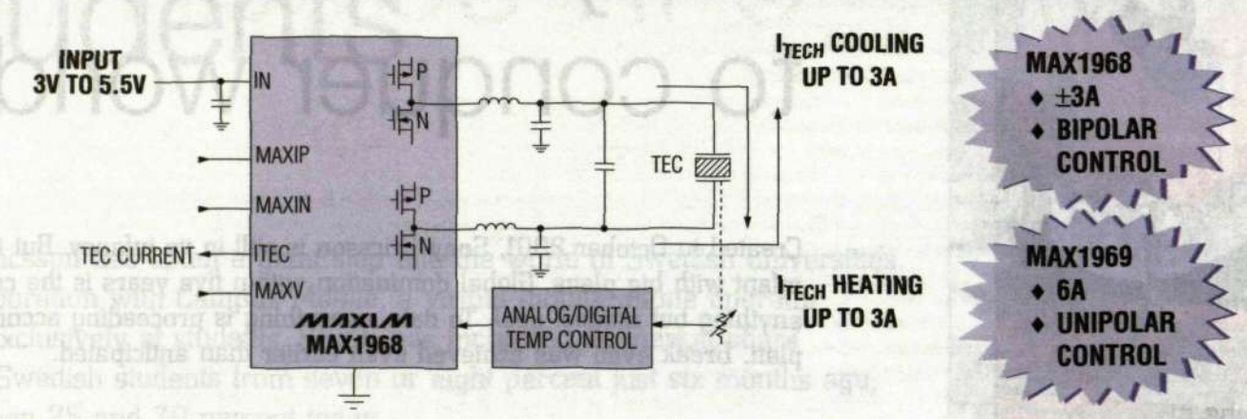

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Most Accurate • Maintains Temperature Control Within ±0.01°C	• High Offset and Drift of Internal Error Amplifier Limits Ability to Maintain Accurate Temperature
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Mobile Video already available in Japan

In Japan, it is now possible to send a five-second video clip with sound and text via a mobile phone to another mobile phone or PC. J-Phone is the operator able to offer this service thanks to Ericsson's packet data solution for the PDC system. It is no exaggeration to say that this is a success among users.

Earlier in the spring, J-Phone launched its Movie Sha-Mail service. At the same time, new phone models appeared, which are capable of sending and receiving short video clips. Movie Sha-Mail has been a major success.

In Japan, there are more than 53 million Mobile Internet users through NTT DoCoMo's i-Mode, J-Phone's J-sky and EZ-web from KDDI. Slightly more than a year ago, J-Phone launched its J-Sky service, Sha-Mail, which made it possible to send images via SMS, that is, the equivalent of the GSM system's MMS. The service was successful and J-Phone has sold more than four million mobile phones with a built-in camera for Sha-Mail.

On March 1, the operator launched another J-Sky service, Movie Sha-Mail. Using this service, it is possible to send a short video sequence to another J-Phone user with the appropriate type of phone. It is enabled by a packet-data system that Ericsson has developed and installed in J-Phone's PDC system.

"At the same time as the service was launched, J-Phone introduced new phone models capable of sending and receiving still images and video clips. These phones are a requirement for using Movie Sha-Mail," explains Per Arvidsson, who is director of sales, J-Phone Business Division.

Per Arvidsson

This telephone with a built-in camera was another global first for J-Phone. Anyone who has the new phone can send or receive a five-second video clip with sound. In addition to sending video clips to a similar phone, it is possible to send these to a PC.

Both pay

Sending a five-second video clip costs JPY 35, about USD 0.28. The recipient also pays a small sum. In Japan, the mobile phone is something of a fashion accessory and the Japanese change their phones often. In 2001, about 43 million new phones were sold.

The phones for Movie Sha-Mail are somewhat more expensive than other phones, costing JPY 29,800 or about USD 242.

FACTS PDC

PDC, which stands for Personal Digital Cellular, was introduced in 1993 and is only found in Japan. In total, the PDC systems currently have more than 58 million subscribers (of a total of 69 million Japanese subscribers).

The largest PDC operator is NTT DoCoMo, with 40 million PDC users.

J-Phone, with slightly more than 12 million PDC users, is larger than KDDI, with 5 million PDC subscribers. KDDI also have 10.8 million CDMA One subscribers.

Ericsson has supplied equipment to J-Phone since 1994, both for PDC and 3G systems. Vodafone assumed control of J-Phone in November 2001.

"During the first three months of the year, J-Phone sold more than 12.4 million phones. The most popular models are those that can be used for Sha-Mail and Movie Sha-Mail. Movie Sha-Mail began in March," says Eiko Mabuchi of J-Phone's PR department.

She adds that an increasing number of phone models for Movie Sha-Mail and Sha-Mail will be launched in the market.

Covering Japan

J-Phone's PDC network covers the entire country and packet data has now been installed in nine of the operator's regional mobile networks. In addition, Ericsson supplies infrastructure to six of the nine regions.

"In addition to new services, packet data offers a higher transmission speed and shorter connection times. Currently, J-Phone's PDC network is crowded, but when packet data is introduced, resources previously used for J-Sky can be used for speech," says Peter Mason, who is general manager for Sales and Product Management, PDC Systems.

Peter Mason

"Now it is also possible to simultaneously receive a message warning of an incoming phone call while using J-Sky," he adds.

J-Phone's 2.5G system – that is, packet data – has the capacity to handle transmission speeds of up to 28.8 kbps. Japan is far ahead with 3G. NTT DoCoMo has already put its 3G network into operation on a small scale and J-Phone is planning a trial launch for June 30 this year.

The fact that J-Phone has now installed packet data in its PDC system may appear superfluous since 3G is imminent.

"Not at all. It should be seen as a complement to the 3G network and can be used for applications that have higher demands on coverage but do not require the bandwidth offered by 3G," says Per Arvidsson.

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Some 60 selected projects were exhibited at Stockholm's Cultural center during the environmental conference, where representatives from throughout the world had the chance to compare experiences and exchange ideas. The russian representative chose to appear in costume. PHOTO: PELLE HALLERT

Environment conference with a mobile profile

An international environmental conference, with an emphasis on concrete measures for improving living conditions in large cities, was recently held in Stockholm. Ericsson was one of the sponsors.

The Stockholm Partnerships for Sustainable Cities conference was organized in conjunction with the 750th anniversary of Stockholm and the World Environment Day. The goal was to encourage and gather ideas on how to improve large city environments throughout the world, and to gather these ideas in a knowledge bank. A competition was announced in conjunction with the event, resulting in 228 entries. Of those, 50 finalists were selected. During the conference, the winning competition entries were put on display at the Kulturhuset cultural center in Stockholm.

"All projects were required had to be concrete, working examples, which is what is so fun about this exhibition. All of the projects actually work, these are not simply desktop creations," explains Cecilia Rubens, the conference's senior technical advisor.

"Many of the projects have also resulted in close collaboration between organizations, governments and companies. Here in Stockholm, representatives have a chance to network with each other. The objective is for these ideas be used in other cities throughout the world. That is what makes this conference so unique."

The selected projects were roughly divided into two main categories, both of them key to all large cities: protecting the environment and curbing traffic. Contributions ranged from educating children in Russia to offering young people in Niger solar-powered radios in exchange for illegal weapons, and from car-free days to methane gas-powered vehicles and children walking to school. As a sponsor, Ericsson took the opportunity to showcase two of its own proposals for how to improve large cities: a mini-GSM system that can be rolled-out quickly to facilitate communications in less developed areas, and a GSM-based traffic information system (RoDIN 24), which can improve traffic flow in more developed cities.

"We're convinced that Ericsson's technology can create a more productive world, and this conference gives us an opportunity to encourage creative solutions to problems in cities. It is also a chance to demonstrate how our own solutions can improve the quality of life for those who live there, and contribute to more sustainable environments globally," says Michele Schmidt, who manages marketing and communications pertaining to environmental and sustainability issues at Ericsson.

Michele Schmidt represented Ericsson in the jury, which selected the best entries.

Michele Schmidt was also one of 15 jury members from around the world who evaluated contributions submitted over the past six months.

"I think that we were asked be in the jury because Ericsson is considered to be a company that takes social, ethical and environmentally related issues very seriously," says Michele Schmidt.

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Building a strong brand

To have a strong brand identity means to state a point of view. The rebuilding of the Ericsson brand continues with guest speakers representing some of the highest ranked brands in the world.

Nick Foggin, director of Strategy and Futurology at Orange, emphasized that a distinct brand must come from deep inside the company.

PHOTO: LEO MCCAULEY

The process of reworking the Ericsson brand strategy is multi-layered. One essential piece in the puzzle is to ensure that there is an internal awareness of a brand's importance. The first guest speaker, Nick Foggin, director of Strategy and Futurology at Orange, spoke about this emphatically.

"The employees must own the brand," he said. "It's really all about creating something that is so universally attractive that everyone wants to be a part of it."

The Nick Foggin visit is one of three seminars arranged in Stockholm to discuss branding from a business-to-business perspective. Representatives from Volvo and the WPP group also agreed to share their branding experiences, which is a branding feat in itself.

Bill Gajda

"The quality of our presenters really demonstrates the power Ericsson has to attract speakers on the brand issue," says Bill Gajda, Ericsson's brand management director.

According to Nick Foggin, a distinct brand identity can be endlessly beneficial for all involved, not least the employees.

"A strong brand gives the employees a sense of where the company is headed, as well as an awareness of the communal responsibility for how the brand is perceived," Nick Foggin said.

In his lecture, Nick Foggin also put branding in the context of the entire telecommunications future. He believes that standardization is the top priority, and welcomes Ericsson's initiatives in that area. However, he also stressed that ubiquity doesn't mean being ever visible.

"Our perhaps greatest challenge right now is to learn to let some possibilities pass us by. We can't afford affiliating our brands with anything we can't take full responsibility for," he advised.

"Simplicity" and "honesty" top the brand value list at Orange. In Nick Foggin's opinion, "reliability" and "accessibility" ought to be on top of Ericsson's. Bill Gajda agrees.

"A brand is built from deep inside a company. We need to rebuild some of that branding culture at Ericsson and reconnect our employees to what the company is all about," he says.

And the reworking of the Ericsson brand continues.

"A brand is all about the experience we are trying to create for employees, customers and shareholders. They all have the choice to go elsewhere," Bill Gajda says, "which means the brand is really a promise that has to be delivered."

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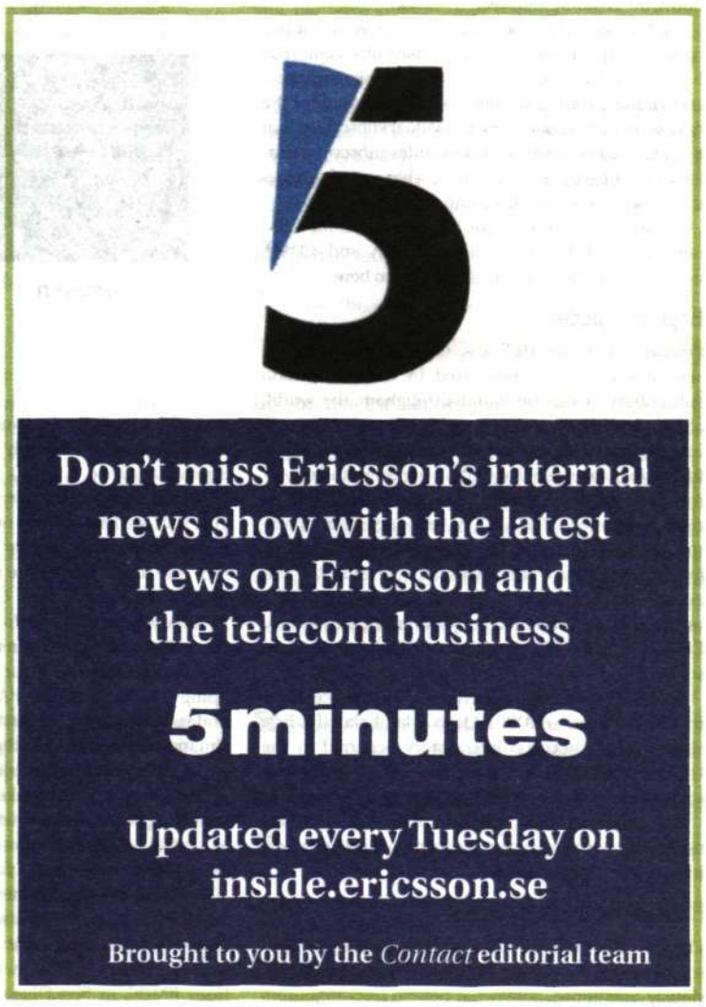
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Triumph in China

When Ericsson was scheduled to deliver CDMA equipment to China Unicom in August 2001, it found itself in a race to the finish. Although its competitors were in the lead, Ericsson was able to pull ahead thanks to hard work and strong products, including the HLR node, which is sometimes referred to as the world's best HLR.

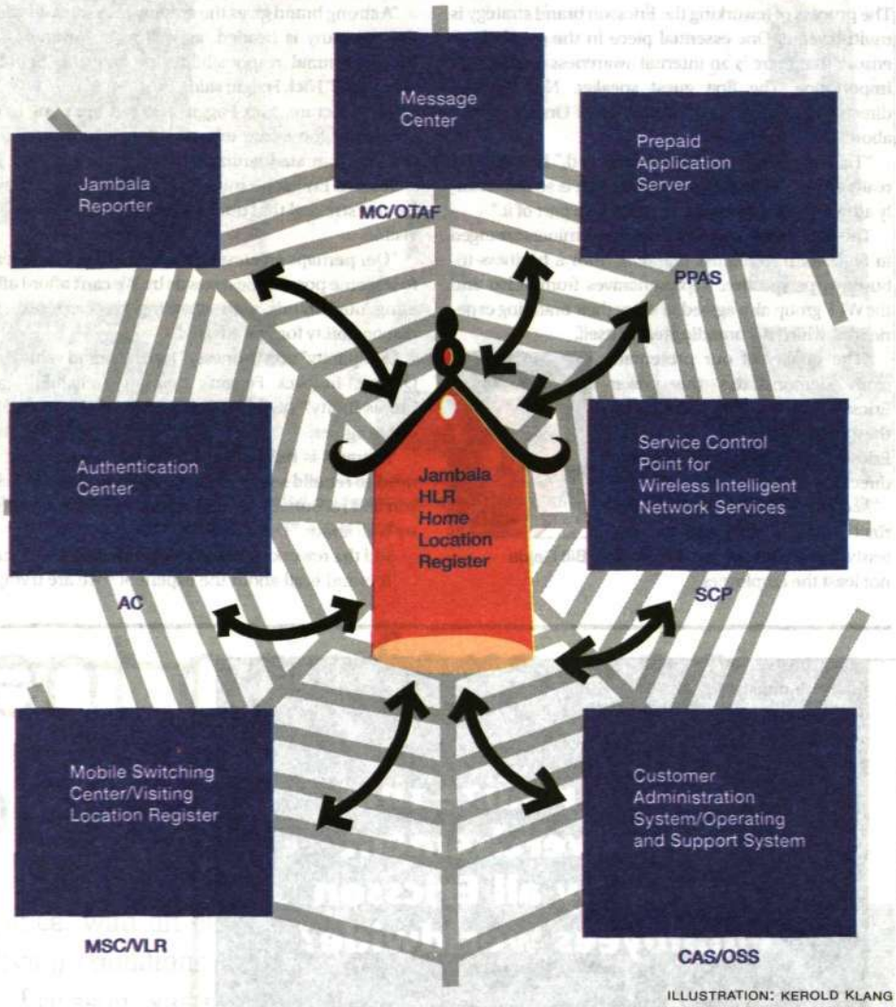

ILLUSTRATION: KEROLD KLANG

When Ericsson conducts business with mobile phone operators, there is usually talk about the sale of switches, radio base stations, HLR nodes and more. Most people are familiar with switches and base stations, but not as many know what an HLR node is, although it is an essential part of mobile networks. Should an HLR go down, the entire system ceases to function.

HLR stands for Home Location Register and it is a subscriber database. Networks consist of several HLR nodes (one HLR can serve multiple mobile switches) and Home Location means that it contains all of the necessary data about every individual subscriber that belongs to a certain area. This includes subscriber profiles, current geographic position, what sort of services the subscriber is currently using and more.

Ericsson's HLR nodes are based on AXE for GSM networks and TSP/Jambala for TDMA and CDMA networks. It is the latter that is referred to here.

Replacing nodes

Ericsson's Jambala HLR has been in existence for several years and is now used by over 30 million subscribers. It can be found throughout the world, although primarily in North and South America. From having previously been mainly a TDMA node, it is now increasingly being sold to CDMA operators and operators who are making the transition from TDMA to third-generation CDMA (CDMA2000). Several operators have also replaced their previous nodes, supplied by Ericsson's competitors, with Jambala HLR. A major advantage of Ericsson's HLR (and other Jambala nodes, such as Authentication Center-AC, and Service Control Point-SCP) is that it is easy to migrate the subscribers.

In Brazil, 600,000 subscribers were successfully transferred from an AXE HLR to a Jambala HLR in a single night. Another success story occurred in the US, where a TDMA operator transferred 450,000 subscribers to new Jambala HLR nodes over a weekend.

An important characteristic of all TSP/Jambala nodes is that they are open, future proof and extremely reliable in their operation.

Race to the finish in China

The situation in China was a difficult challenge. Ericsson came into the picture fairly late in the game, as previously mentioned, somewhat behind its competitors and China Unicom had made very specific requirements. As a result, the only thing to do was to take an aggressive stance.

Gunnar Heldebro

"When we arrived there in August 2001, we had to figure out how we could quickly catch up in the race and at the same time supply functional nodes," says Gunnar Heldebro, head of the Node Development Center in Montreal, the unit that is responsible for developing TDMA and CDMA HLR nodes, among other products. This situation, by the way, was the same for all other nodes in the Ericsson CDMA solution.

"We found ways of making incremental deliveries, supplying solutions to Unicom specific requirements as several functional drops where the last one for this release will be delivered in July 2002."

The HLR unit in Montreal is part of the product development unit Network Databases and Value Added Solutions in Kista, headed by Odd Svesse, and the overall CDMA network project is overseen from BMOC in San Diego, while the newly formed KAM for CDMA in China is responsible for customer contact.

To date, Ericsson has delivered HLRs to eight sites and is now also participating in training the local organization.

Functional process

"The CDMA organization has been driving hard to create efficient routines and tools in cooperation with its customer," says Gunnar Heldebro. "A test lab has been set up in China that will be part of network integration testing for future releases."

It is significant that Ericsson has now entered the Chinese CDMA market, since China offers significant potential for growth.

Currently, with the latest expansion order in April, Ericsson has provided China Unicom a cdmaOne network that covers seven provinces. In addition Ericsson is conducting trials for CDMA2000 1X. Ericsson's Jambala HLR 3.1 can be used with both 2G and 3G systems.

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Thin clients instead of PCs

Given the need today to reduce costs, many units are starting to go back to central systems with thin terminals, instead of giving everyone a fully loaded PC. The new server-based solution with simpler terminals has many advantages.

"After 20 years, we have come full circle and are once again seeing more and more centralized solutions," says Håkan Wedin, product manager for IT solutions for Ericsson's workplaces. "The real reason for centralization is economic, but the truth is that not everyone needs a fully loaded PC to do their jobs. A simple terminal with a processor and a graphics card is more than enough."

Instead of many local servers for e-mail, SAP, et cetera, everything is being put on a few servers in a data center, where there is also a terminal server (TS) to which thin clients can be connected. These may be an ordinary ESOE PC, a PDA, a Unix terminal or any other client.

Small and quiet

A thin client from Compaq, for example, lives up to its name. It is surprisingly small and quiet. On the other hand, it is little more than a workstation with a power switch, a network contact and a USB port. All processing occurs on the mainframe in the data center. There are therefore no data files transferred between the mainframe in the data center and the terminal. Instead, only commands, which are encrypted, are transferred. Everything normally done on the PC is performed centrally on the server.

Individual users must adjust to working somewhat differently than previously. If the network goes down, no work can be done at all. The advantages, both practical and economical, are far greater, however.

"It actually all started when we realized that it would be very expensive to give all our Unix users their own PC simply to access the Office applications," explains Håkan Wedin. "Many R&D units had previously used a TS to solve the problem. For most everyday PC tasks, considerable savings can be realized with as few as 700 users, according to one study."

If everyone was to work with thin clients, there would be a substantial cost initially for purchasing terminals, but over time, costs would be significantly less for hardware, user support and software deployment. One direct and tangible benefit for users is that they never need to upgrade their PCs with new software, extra memory, new operating systems or hardware. This is particularly important when one considers that there are tens of thousands of PCs within Ericsson today or clients that use SAP daily and need frequent updates.

"It is also possible to implement a thin client solution directly using old hardware, even a 286-based PC. A connection to a TS can be made over a low-quality network with limited bandwidth. All this can be done without losing quality," observes Håkan Wedin.

Faster connections

There is a story from Denver in the US that illustrates the practical side of things. After a long period of problems with the local server, it was decided that users should be connected to an ESOE 2000 Terminal Server in Richardson, Texas, while a new server was installed. To the surprise of the IT people in Denver, starting Outlook and connecting to the Internet was quicker than before. Now everyone works against the TS using such applications as Word, Excel, Internet Explorer and Acrobat.

The greatest difference is for mobile laptop users. The fact that all data is stored on the server, instead of on the user's machine creates some problems. However, there is now a solution that synchronizes files between the laptop and the central server.

In summary, users have a simpler machine and use less bandwidth, since they are not sending files across the network and all files and software are updated in a single location, in the central server. Taken together, these changes result in dramatic savings.

"In time, I believe that everyone will have some kind of thin client," predicts Håkan Wedin, adding that a new version of Terminal Server 2.0 will be released in June.

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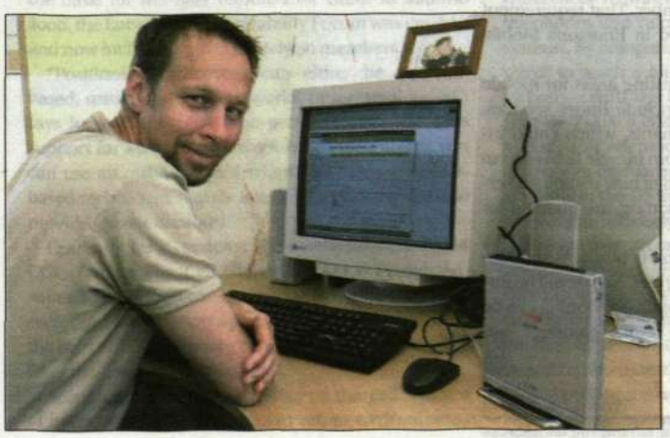
FACTS ESOE

ESOE 2000 Terminal Server is a solution that emulates (simulates) a desktop environment on a PC client or Unix or Linux workstation or on a PDA for ESOE 2000 applications or for enterprise systems, such as SAP, Scala, TEADS and Primavera.



"With a thin client (lower right corner) instead of a fully loaded PC, less bandwidth is required, while users experience the same quality on their workstations," says Håkan Wedin, product manager for IT solutions for Ericsson's workplaces.

PHOTO: ECKE KÜLLER

Important position for Ericsson director

Östen Frånberg, technical director at Ericsson, is the first Swede to be elected to the Board of the Internet Society (ISOC), which focuses on such central issues relating to the Internet's future as standards, openness, security and expansion.

Östen Frånberg

"One of my tasks is to describe the mobile world's view of wireless issues and how hundreds of millions of mobiles will be connected to the Internet. That is, the Internet's next major expansion."

Östen Frånberg is well-acquainted with both sides of the newly combined telecom and datacom world. He worked on the development of AXE, and has devoted the past 15 years to Internet issues as computer manager at EIS and within Ericsson's development organization. Other assignments have included the post of chairman of the Swedish branch of ISOC.

www.isoc.org

Product information for CDMA important

"One of the most important parts of a new product is the product information for the customer," says Douglas Brown, director for CDMA technical information.

Douglas Brown

"Without accurate and timely information, customers may not understand how to use the product correctly. The marketing organization is also not able to sell the product effectively, and the support organization cannot give proper support."

During the past 18 months, the business unit has been working with customers in the Ericsson CDMA User Group to learn what type of information customers need and how it should be communicated.

In addition, the unit has been working closely with other Ericsson Product Information units and is now using many tools and methods from GSM and WCDMA that enable them to provide easily available information on web portals throughout the product's life cycle.

Cpistore.ericsson.se

https://businessworkbench.ericsson.se

tips

Do you need to access your Ericsson mailbox during your vacation? No problem, according to Gunilla Ahrens at Solution Management IT. Go to an Internet café or use a PC at an airport or hotel or a private PC (without ESOE).

You can do the following: Read messages (without attachments for security reasons) and send e-mail, as well as access your calendar and contacts. To be able to use this service, you must have a RACOM subscription, a browser with 128-bit encryption and of course an email account in Ericsson's corporate email system.

Depending on where you are in the world, use one of the following addresses:

https://ima.ericsson.net (Europe, Middle East and Africa)

https://ima.ao.ericsson.net (Asia)

https://ima.ericy.com (North and South America)

If you need a pocket guide describing the services, print out the following:

Erimail.ericsson.se/products/ima/Pocketguide2.doc (and put it in your wallet!)

Positioning makes life easier

Information, advertising, games and navigation – the list of mobile positioning services is long. Within this area, there are services that are easy to install for operators and which can quickly reach many users. With a market share of over 40 percent, Ericsson has delivered its Mobile Positioning System (MPS) to operators throughout the world.

Perhaps the simplest way to describe Location-Based Services is to say that they are mobile phone services built around where you as a user are located. For users, this translates into services that make daily life easier – saving time, providing diversion and increasing personal safety. For operators, it means new markets with opportunities to rapidly increase traffic across mobile networks.

Bertil Udd

"The foundation of Location-Based Services is Ericsson's Mobile Positioning System, which was launched about two years ago. We currently control over 40 percent of the market, having signed 25 contracts in countries around the world," explains Bertil Udd, head of Sales Support for Location-Based Services.

Telia launched the world's first commercial positioning service in June 2000, with its Yellow Pages close to you. Since then, the operator has launched ten more positioning services.

In addition to Telia, Ericsson has signed contracts with 24 other operators. One of those that has made significant progress is Turkcell. Its GPRS Land will soon offer 15 different positioning services.

Services can be divided into various categories including information, security, tracking, games and navigation.

Ericsson's Location-Based Services is a total solution that is easy for operators to integrate into their mobile phone systems.

"Starting this autumn, it will be possible to use the same solution in both 2G and 3G networks. Another advantage is that services work with all GSM telephones," says Bertil Udd.

Locally adapted positioning services are of interest to operators. In that regard, Ericsson Mobility World – which now exists in 28 locations around the world – plays an important role. According to a new EU directive, it must be possible to determine the location of calls placed from mobile phones to the 112 emergency number. This requirement is likely to foster other positioning services on mobile phone networks. New legislation regarding this area is expected to be ready in member countries by mid-2003.

In the US, it is already a requirement that telephone operators determine the position of mobile phones that call the 911 emergency number. That requirement is currently being implemented in Ericsson's Mobile Positioning System.

"Safety is one of many interesting areas for mobile positioning. Other examples include finder services, targeted advertising and shipments, which could include all kinds of transports, from bicycle deliveries to trucking companies. The launch of new combined services, such as MMS with positioning, are planned for this summer."

For operators, the combination of business and mobile positioning is an interesting one. Now it will be important to demonstrate that mobile positioning can be much more than just mobile phone gaming," says Bertil Udd.

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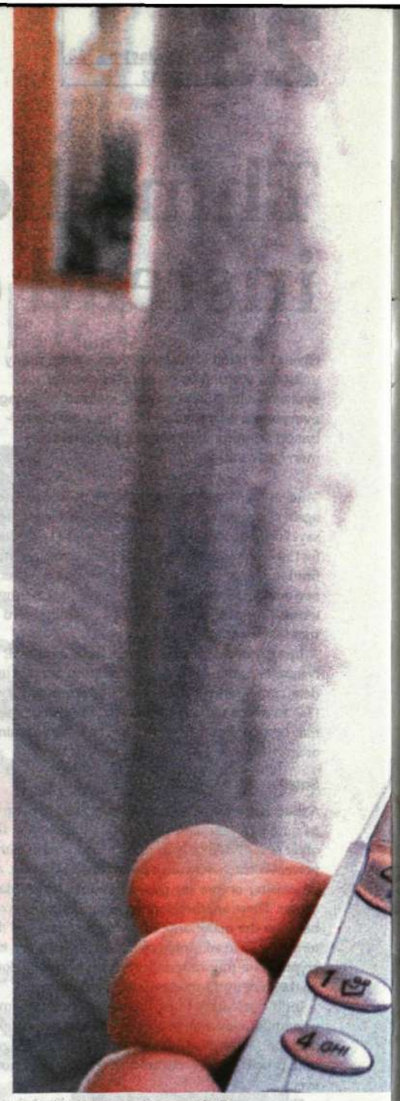
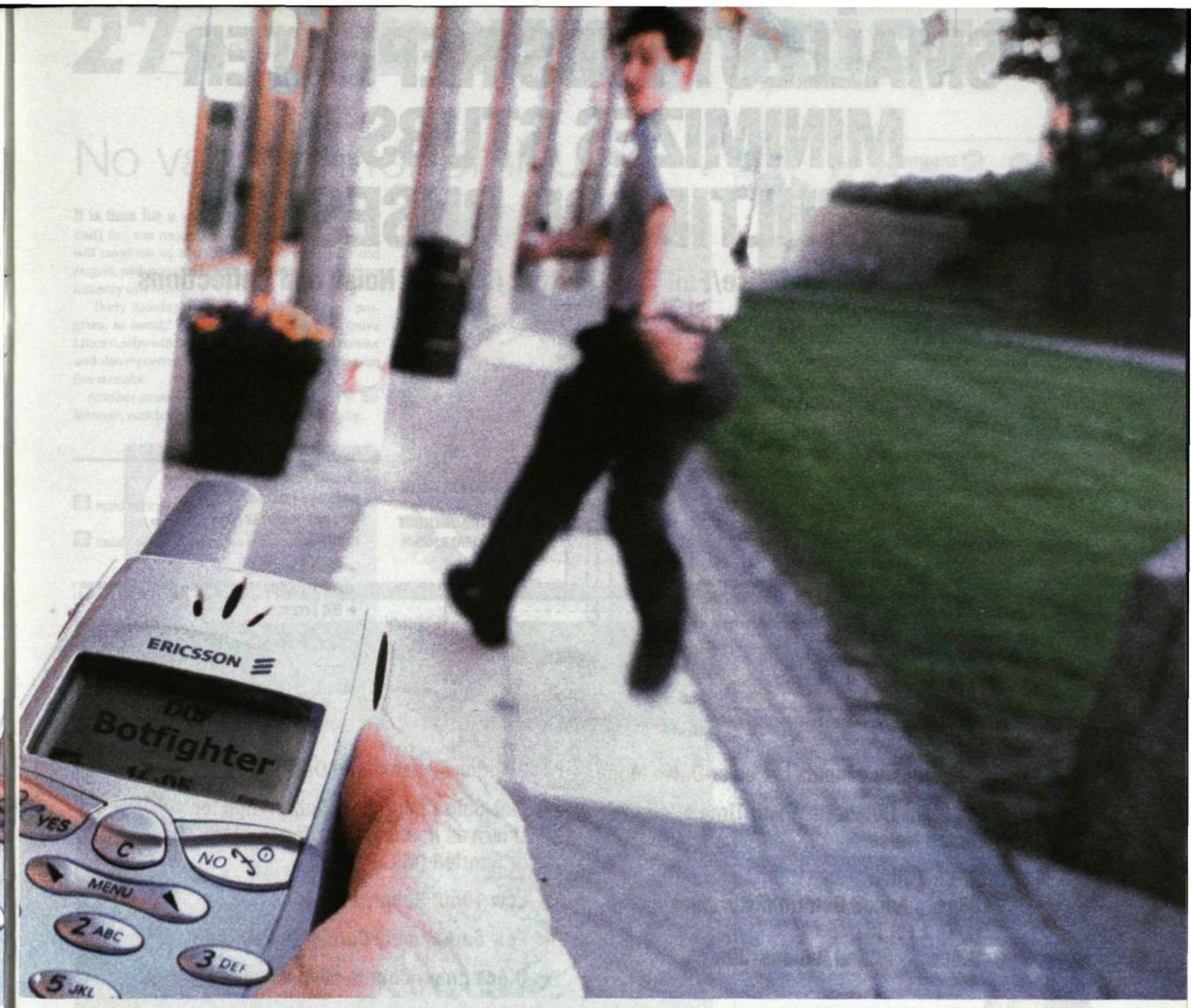


Botfighter is a popular game built around mobile positioning. Like a game of virtual paintball, the playing field is the real world. Gaming does not, however, constitute the biggest market for mobile positioning, but rather other areas such as emergency services and freight transportation.

PHOTO: PELLE HALLERT



MPS based on several techniques

Ericsson was early to market with its Mobile Positioning System (MPS) solution, offering its first version, MPS 1.0, back in 1997. This subsequently formed the basis for the 1999 standard for GSM. In autumn 2000, the Location Interoperability Forum was created, and now includes approximately 90 members.

"Positioning techniques can either be network-based, using intelligent networks, or terminal-based," says Jonas Nordström, who provides technical sales support for MPS. "For network-based techniques, you can use an ordinary GSM telephone, while terminal-based techniques require special telephones, but also provide greater accuracy."

Currently, for 2G systems, there is the network-based CGI + TA system (Cell Global Identity + Timing Advance). The system can determine in which cell or cell sector of a base station a person is located in and, with the help of TA, the system can determine how far away from the tower the subscriber is.

Accuracy depends on the size of the cell. Ranges of between 2 and 300 meters in urban environments and up to several kilometers in rural areas are common.

Terminal-based E-OTD (Enhanced Observed Time Difference) requires new software to be installed in telephones and calculates a position using three base stations. By comparing the amount of time it takes for a signal to reach a telephone from three separate base stations – with the help of a Location Measurement Unit or LMU (GSM radio + GPS receiver + mobile phone) and reference time from a GPS satellite – the system can calculate one's position. This system will be available in the US by the autumn. Accuracy ranges between approximately 50 and 300 meters.

The greatest accuracy, between 10 and 30 meters, is achieved through the use of terminal-based Assisted GPS (A-GPS), which requires both software and a GPS chip in the telephone. GPS reference receivers within the mobile phone network provide GPS assistance data, such as from nearby GPS satellites, to telephones. A-GPS offers better coverage, faster positioning and lower battery consumption compared with traditional GPS. It will be available next year. For 3G networks, both network-based – Cell ID + Round Trip Time (RTT) – and terminal-based – Observed Time Difference of Arrival (OTDOA) and A-GPS – systems are being developed. Cell ID + RTT is the 3G equivalent of CGI + TA. OTDOA works the same way as E-OTD.

Currently, Ericsson offers CGI + TA in its MPS-G 3.0 solution, with the G standing for GSM. This autumn, the standardized MPS-G 5.0 solution will be available, which also supports E-OTD and A-GPS. One solution for 3G, MPS.U1.0, will also be available.

MPS consists of positioning software within the mobile phone network together with an SMPC (Serving Mobile Positioning Center), which calculates latitude and longitude, as well as a gateway for services, GMPC. In 5.0, SMPC is separated from GMPC and moved farther out into the network. Moreover, Ericsson also offers LMU either wirelessly or via cable.

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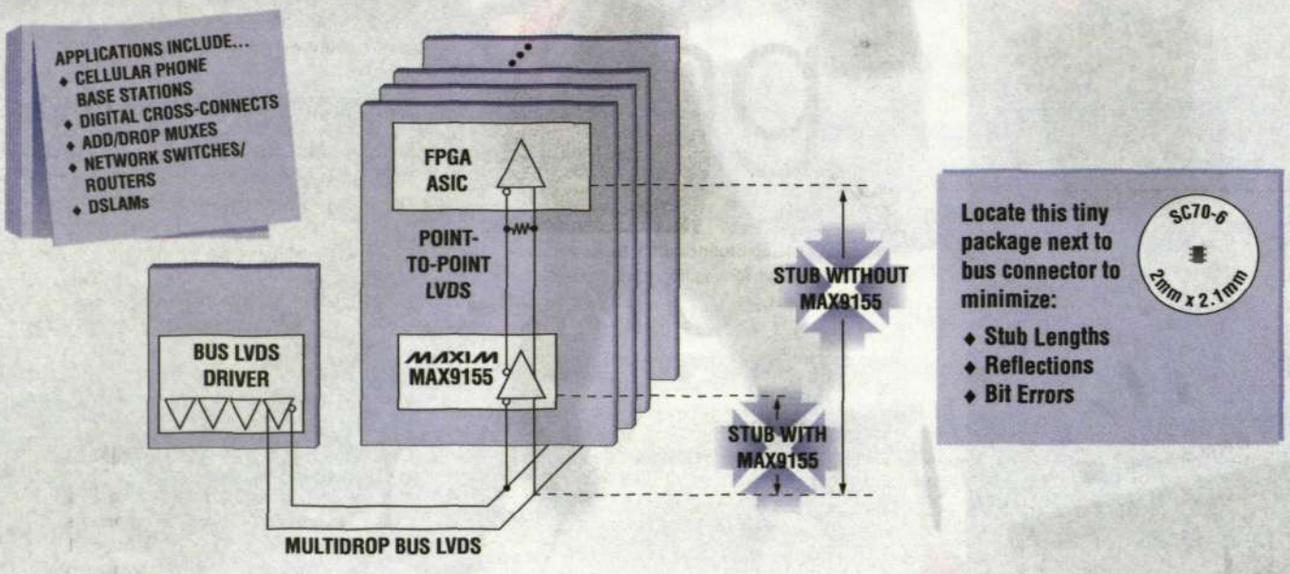

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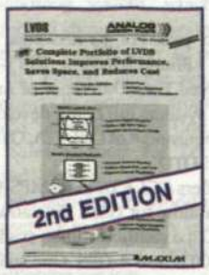
MAX9156EXT-T	LVPECL	LVDS	200	0.5	0.6	23	6-SC70	0.95

†2.5k piece price provided is for design guidance and is FOB USA. International prices will differ due to local duties, taxes, and exchange rates. Not all packages are offered in 1k increments, and some may require minimum order quantities.



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No vacation for 5minutes

It is time for a vacation break at *Contact*. But don't fret too much. The news program 5minutes will continue as usual throughout June, July and August, with news from both inside Ericsson and the industry as a whole.

"Every Tuesday we will be producing a new program, as usual," assures Dodi Axelson and Tonya Lilburn, who will be serving as news anchors, editors and also reporters for certain segments over the next few months.

Another news source that never dries up is the intranet, which will continue to be updated daily.

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inside.ericsson.se

inside.ericsson.se/5minutes

5minutes will keep broadcasting. News anchors Dodi Axelson and Tonya Lilburn will guide us through all the news. PHOTO: ECKE KÜLLER

from the archives

"A number of LM children have spent the summer at camp again this year." So read the *Contact* caption in 1945, which also reported that the experiences were all positive. The children certainly returned home healthy and suntanned, and both they, their parents and the camp director were very satisfied. Summer camp operations for children were financed through contributions from the company as well as by plant workers who chose to forgo their overtime pay for this purpose.

Happy award winners in Malaysia.

Mobility World in Malaysia

Ericsson Mobility World has now been launched in Malaysia as well. That means there are now 47 centers located throughout the world. In conjunction with the inauguration, several awards were given out to companies that have developed interesting mobile applications.

The Kacip@Cut-Edge Awards 2002 were announced in November 2001. In the Malaysia category, the Messaging Technologies company took home first prize for their eBuzz SMS portal. The portal offers everything from ringer signals to games, chat, e-mail and more.

My tooth is ringing!

Forget about conventional cordless hands-free products. Now there is an even more discrete way of using your phone. Researchers have developed a tooth implant that picks up digital signals from a mobile phone or similar device and beams them straight to your ear. The implant uses bone resonance to send messages to the wearer's ear. Unfortunately the new invention is not yet for sale, but you can see it at the Science Museum in London. Source: Silicon.com

new assignments

Mats Otterstedt is the new country manager for Nicaragua and key account manager for Enitel.

Anna-Carin Bodin is the new head of internal communications at the Systems business unit. She previously held the same position at the former Multi-Service Networks business unit.

Mikael Steinbach will become the new executive vice president for Services and Operations at the Central America and Northern Latin America market unit, effective July 1. He will also become the country manager in Panama.

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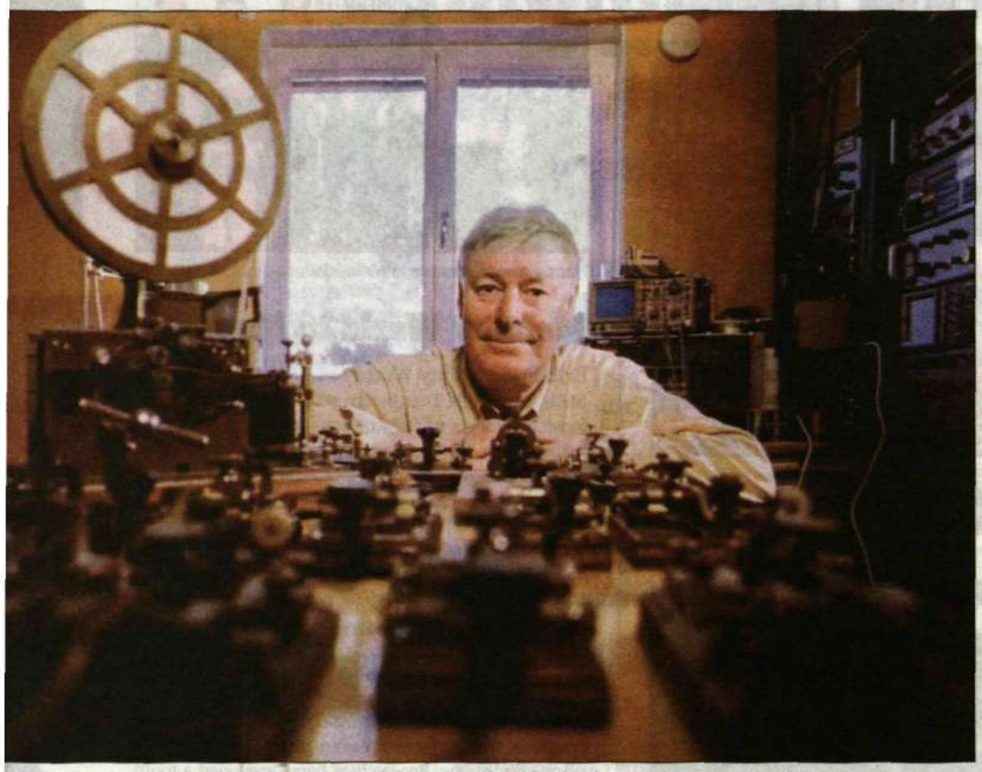

In order to become an amateur radio operator, Kåre Wallman took a course in telegraphy when he was a young man. This marked the beginning of a life-long interest in telegraphic equipment. Today he owns the foremost collection of telegraphic equipment in northern Europe. PHOTO: PELLE HALLERT

A fascination with telegraphs

"Wallman," says the sign on the door, though it might just as well say "Telegraph Museum." Here, in Kåre Wallman's apartment on an island outside Stockholm, is the foremost collection of old telegraph equipment in northern Europe. Ericsson's founder, Lars Magnus Ericsson, began his career by building and repairing telegraphic machines, several of which are part of Kåre Wallman's collection.

"When I was a young lad, I loved to listen to shortwave radio and dreamed I would be an amateur radio operator. To be that, you had to learn to send telegrams. So I took an evening course in telegraphy, and that's how I got into it," Kåre Wallman explains.

Telegraphy, telephony and radio communications run like a thread through his entire working life. From the mid-1980s until his retirement this past winter, Kåre Wallman worked at Ericsson Radio Access. Now he works as museum technician at the Telecommunications Museum in Stockholm.

LM Ericsson manufactured telegraphic equipment from the company's inception until the 1930s.

Kåre Wallman's collection includes many telegraphs from this time, the oldest being a pair of mirror telegraphs – heliographs – from 1835. The collection also includes a few old Ericsson telephones from the late nineteenth century.

"A nice part of the job of a collector is tracking down old equipment and finding missing parts for machines. I'm in contact with collectors in several different countries, and we let each other know when we come across old equipment," he says.

In addition to telegraphic machines, Kåre Wallman also collects encryption equipment.

"This is an encryption key," he explains, producing a small army-gray box. "Finding such articles is difficult since they were used in the military."

Encryption is not a far cry from secret agents and spy novels, another of Kåre Wallman's interests. His well-filled bookshelves contain the works of most major writers of spy stories – for example, John le Carré and John Forsythe.

"I collect all literature that is in any way related to telegraphy," he explains.

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column

LARS-GÖRAN HEDIN
corporate editor

Breaking up is never easy...

The other day we said farewell to a colleague who was leaving Ericsson for a position in a completely different industry. As always on such occasions, I felt happy and sad at the same time.

On the one hand, it was sad to have to part with a well-liked colleague, but on the other, I couldn't help share his enthusiasm and excitement about starting something new, something at which he would continue to develop as a person and as a professional.

My pal chose to leave the company of his own free will. Today, many other colleagues are finding themselves in the same situation involuntarily – due to the essential cutbacks and rationalization measures that have characterized day-to-day life at Ericsson for more than a year.

On the way home from the farewell party, it occurred to me that leaving a workplace should perhaps always be viewed in a more positive light. I recalled a radio show a few years ago in which they philosophized over our fear of change, over how people in some parts of the world consider an employment position as a life-long relationship with the workplace rather than just one station on the path of an individual's personal development.

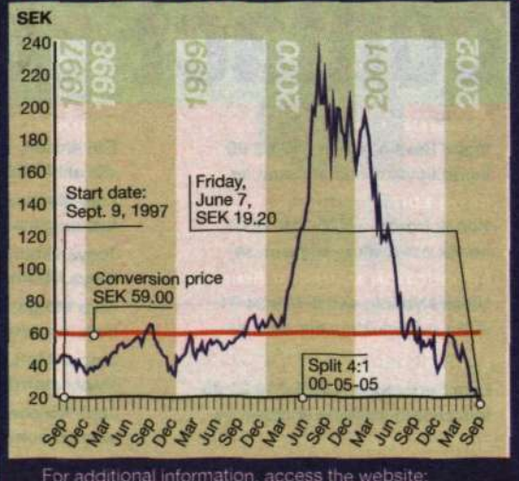
They spoke about friends who had received redundancy notices from Ericsson and who after a few months discovered it was the best thing that had happened to them – and that they felt highly stimulated about having the chance to try something new.

Of course, I realize that the loss of a reliable source of income and the uncertainty about finding a new job can be very stressful.

No doubt there are many personal tragedies in the wake of the workforce reductions. Still, I believe that these are far outnumbered by the examples of colleagues for whom things have worked out well.

Ericsson has capable and energetic employees, many of whom possess knowledge that is in great demand outside the company. So, although being laid off may feel like a heavy burden, there is a good chance that it will not be as fateful as it seems at first.

the ericsson b share



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