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MOBILE DATA MAGAZINE

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JOACHIM
KAARSGAREN

Joachim Kaarsgaren, who was appointed as the new managing director for RAM Mobile Data NL late last year, has wasted no time in making his mark on the company. Under Joachim's leadership, the Dutch Mobitex operator is advancing operations and entering new markets.

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is the key to success in the wireless data industry. As Mobitex and a new generation of interactive applications enter the mainstream and create a true mass market, more and more companies are recognizing the benefits of partnership in creating the solutions that customers want.

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JOINING FORCES FOR
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Teklogix and Ericsson have joined forces as Teklogix now launches Teklink, a Mobitex-based solution for wide-area and large-area logistics. Copenhagen Airport is one of the first customers and a showcase for the new solution.

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BUILDING BUSINESS ON
TRUST

Mobitex operator RAM Mobile Data UK recently created a Software and Services Group that functions as an independent profit center within the company. In addition to offering a wider range of professional services, the new unit is helping the Mobitex operator to form new partnerships and earn revenues at an earlier stage in customer projects.



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- Nomadic presents modems for all markets
- Palm users have more ways to get on the Web
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THE NEW MOBITEX BUSINESS OPPORTUNITY



There is a new excitement in the Mobitex world about the opportunities going forward. Existing operators are building out their networks at a rapid pace. New operators are coming online. Wireless Internet, IP and a seemingly insatiable demand for information are of course trends driving this growth.

As many people are discovering, Mobitex is a proven, cost-effective and readily available technology that meets people's needs today. Interactive messaging and a new generation of truly small devices are creating new applications and services that deliver real value for users. Today, interactive messaging is but one of a new generation of interactive applications that includes wireless Internet, information services, banking and electronic commerce.

At the same time, Mobitex continues to make advances in traditional vertical markets. Increasingly, there is a realization among operators and customers that Mobitex is an industrial-strength technology for mission-critical operations that provides short pay-back times.

There are two key lessons to be learned from the growing success of Mobitex in markets around the world. First and foremost, we must continue to focus on the key strengths of this dedicated narrowband technology for wireless packet data networks. Its suitability for bursty data transactions in which responsiveness and latency are crucial make it ideal for interactive applications. As an extremely robust, efficient, secure and reliable wireless data communications channel, it has proven to be the superior choice in a wide range of vertical applications. Yet, we must keep our eye on the ball and continue to focus on the markets and applications for which Mobitex is the most cost-effective choice.

The second lesson to be learned is that no one can succeed alone. The success that Mobitex is now enjoying is the result of collaborative efforts in which many parties have worked hard to grow the market and to deliver value to the customer. Partnership is also the theme for this issue of Mobile Data Magazine, which provides many examples of how operators, hardware and software vendors and systems integrators can work together to ensure the success of Mobitex going forward. Today, there are new business opportunities from which everyone can benefit.

There is not only a new world for Mobitex. We've given Mobile Data Magazine a new look that we hope you will find more attractive and more convenient. As part of the new layout, we are trying to provide more and shorter news items so that the many companies contributing to the technology's success will be given more room. We're also including new columns that will hopefully provide a more varied perspective on developments in the Mobitex world. Please let us know what you think. We want to make Mobile Data Magazine an even more informative and valuable marketing tool.

We are also making another change. This issue will be my last as publisher of Mobile Data Magazine. With the next issue, I will hand over the reins to Pontus Lindquist, head of Ericsson's Mobitex business, whom many of you know well. I would therefore like to take this opportunity to thank you all for many exciting years with Mobitex. I wish you continued success.

Gunilla Rydberg

Gunilla Rydberg

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BECOMING A TOTAL SOLUTIONS PROVIDER



Joachim
Kaarsgaren

Joachim Kaarsgaren, Managing Director of RAM Mobile Data NL took the time recently to talk with Mobile Data Magazine about the Dutch Mobitex operator's strategy and current and future business prospects.

How do you view RAM Mobile Data NL's current position?

Thus far, RAM Mobile Data NL has been primarily a data service provider. In this capacity, we must focus on our core competence. This is of course primarily the packet technology on which our Mobitex network is based.

This core technology delivers superior service for customers seeking professional solutions to support mission-critical activities in the field. The Dutch Mobitex network is simply the best choice for our targeted customers. Over the past year, we have enhanced coverage in the northern and southern parts of the country, as well as upgraded the system software. Now, we are moving into new markets and new services, preparing for the next phase of our growth. These services will include a wide range of future technologies as well as professional services.

What will these new markets be?

We have been very successful in the markets that we originally targeted, such as the public sector, transport, logistics and field service. New markets that we have opened up more recently are parcel tracking and point-of-sale. RAM's Mobitex system is the only public network certified for wireless payments, and we are experiencing very strong growth in this market.

In our view, there are a number of other market segments that are now ready for wireless data. These include parking applications, telemetry and security. There are a number of very cost-effective and high-quality solutions available for these sectors that will help us open the market quickly. We believe there is a tremendous potential in these segments in the Dutch market.

What are your plans for the future?

Our main priority in preparing for the growth that we anticipate, is to create an organization for Professional Services and Consulting that will strengthen our sales process. This is crucial to our business because we always have to deal with optimizing customers' business processes. As we see it, this process involves delivering various levels of professional services. First there is what might be called a quick scan, during which the customer sizes up the supplier and vice versa to determine whether or not wireless data is an attractive option. This is followed by a period of technical and business consulting during which the customer's business process is analyzed and the prerequisites for a successful wireless data solution are determined. Only then, when the business case has been quantified and the expected return on investment is known, can we begin building a solution with the customer.

By offering a range of professional services that includes consulting and project management, we want to work with our customers throughout the entire sales cycle from initial enquiry to full-scale deployment, which can be quite a long period. We have extensive data for many market segments to help the customer build a realistic business case. We also have a selected group of business partners with specific skills in software development and system integration that can be brought into the picture at the appropriate stage. Professional services will allow us not only to bring technical knowledge, but also financial and business expertise to bear on solving the customer's requirements and help us become not just a data services, but a total solutions supplier.

What about the Internet?

Once consulting and project management services have been developed, we intend to expand our services to include the Internet. These services will be based on a Mobitex gateway to the Internet that is already available. We will then add Internet-specific enhancements to the Mobitex network to support field service organizations, the transport sector and police services.

The Track and Trace service, which is an in-house developed application suite, provides an excellent example. This service provides a web-based application that allows users to track vehicle and parcel locations, which of course have been transmitted to the database directly from the field over the Mobitex network. This Track & Trace Service will be commercially available at the end of April and, with this as a foundation, we will gradually expand Internet services over the coming year within our so-called RAM Internet Navigator Center.

KPN Mobile has announced an agreement by which it will acquire RAM Mobile Data NL from the current owners BellSouth and France Telecom. What will this mean for the business?

It will be very positive. We have been looking for some time for an international partner with a strong position in our home market. That partner is KPN Mobile. We look forward to continued expansion, since KPN Mobile already serves 60 percent of the Dutch corporate market, and to working with a strong owner who shares our vision for the future. ■

MOBILE BUSINESS NEWS

KPN MOBILE ACQUIRES RAM

KPN Mobile of the Netherlands recently signed an agreement to acquire RAM Mobile Data in both the Netherlands and Belgium from the current owners BellSouth Corporation, France Telecom and NPM Capital. The new owner is the Dutch market

leader in mobile telephony.

"A strategic partnership with KPN and its Belgian operations builds a unique center of expertise in the wireless data market. The synergy between our organizations will support and expand the solutions offered to the Belgian busi-

ness market," says Marc de Buyser, president and CEO of RAM Mobile Data Belgium.

KPN Mobile sees the convergence of mobile data as an important driving force in its market. With the acquisition, the new owner expects to strengthen its lead in mobile data. ■

NEXT MOA MEETING IN SWEDEN

MOA will hold its next meeting this autumn in Gothenburg, Sweden, the city where Mobitex is developed. Given the location and the huge success that Mobitex has achieved in the market recently, this should be an eventful and memorable meeting. The meeting is scheduled for October. Further information will be posted on the MOA website, which is also a valuable source of Mobitex news. ■



www.mobitex.org



MOBITEX GROWING IN LATIN AMERICA

The Telecom Americas 2000 exhibition held in Rio de Janeiro on April 10 to 15 was historic in that it was the biggest telecommunications event ever held in Latin America. Rio was also an appropriate venue for the event, since Brazil is Latin America's largest telecom privatization to date.

Ericsson was one of the ten largest exhibitors at the event, which attracted companies from more than 30 countries. The entire Ericsson portfolio of products, services and solutions was shown at the Ericsson booth, which naturally featured the very latest in wireless technology.

Mobitex was shown in the Mobile Internet area alongside WAP, mobile E-commerce and messaging products, and attracted considerable attention from visitors from all over Latin America, who were impressed by the demonstrations of interactive

messaging using RIM 950/957 and the Palm VII.

NEW BRAZILIAN OPERATOR

Prior to the exhibition, a contract was signed with Universal Network Technology S.A. (UNT) for a Mobitex network that will serve Rio de Janeiro, Curitiba and Sao Paulo. The new Brazilian operator will initially focus on mobile and fixed point-of-sale in combination with transport applications.

Ericsson Mobile Data Design also conducted a Latin American roadshow in early March in preparation for Telecom Americas 2000. Interest in Mobitex is growing in Latin America, and negotiations are in progress with several potential operators. ■

MYBIZ INTERACTIVE BRINGS WIRELESS TO THE WEB

MyBiz interactive is a new BellSouth brand and the next step in the evolution of wireless data communications. Building on the Mobitex operator's successful interactive messaging service, MyBiz interactive takes wireless data to the next level and opens new horizons for business and personal users. With MyBiz interactive, users will have access to multiple services on a single device.

MyBiz interactive, which was introduced at Wave 2000, is a new Web-based service that offers an expanded range of interactive applications. In addition to interactive messaging, which is being expanded and renamed Interactive Messaging PLUS, MyBiz interactive will offer corporate e-mail,

information and e-commerce services for businesses and individuals. Add-on services to be made available this summer include a Personal Information Manager (PIM) and a Personal Message Manager.

"BellSouth MyBiz interactive is an overarching vision of our e-business strategy that will result in the merging of wireless with the Web," says William F. Lenahan, president and CEO of BellSouth Wireless Data. "While people today are talking about wireless access to the Web, our vision is that tomorrow we will think of wireless as the Web."

With a single device, such as the RIM 950 or the new RIM 957, users will have access to a wealth of Internet and enterprise services, as well as corporate e-mail based on Microsoft Exchange or any POP3/IMAP server. Users will be able to access public Internet portals and public or private Web sites to retrieve information, run applications and conduct e-commerce transactions.

"As more and more people discover the critical benefits that wireless data delivers to them while they are far away from their desktops, they will be looking for more and more capabilities," says Lenahan. "No two companies or people are going to have the exact same needs. That's where the MyBiz interactive services fit so perfectly, because they literally allow users to define their own wireless data communications solutions." ■

www.bellsouthwd.com



MOA WELCOMES ORBCOMM



The Mobitex Operators Association recently welcomed satellite operator Orbcomm as the organization's latest associate member. Orbcomm, which is based in Dulles, Virginia in the US, has been attending MOA meetings and contributing as an observer for some time. Now the company takes the step up to associate member status.

Orbcomm offers affordable global wireless data and messaging communications from space. The operator's satellite system covers virtually the entire globe, and the company also has representatives throughout the world. ■

www.orbcomm.com

HOT OFF THE PRESSES



NEW POS BROCHURE

This market guide briefly describes the application areas and business possibilities of wireless point-of-sale, as well as the technical advantages of using Mobitex technology. Case studies from several different countries are presented and the guide includes a comprehensive listing of Mobitex-enabled POS terminals.



NEW M3000 BROCHURE

Find out more about the technical features of the M3000. This brochure also describes the options available that make it more than a modem.



NEW COMPETITOR COMPARISON

Mobitex vs. Reflex. What are the differences between Mobitex and Reflex? The answers are here, along with a head-to-head comparison with regards to capacity, scalability, latency and reliability. Also includes a business case.

www.ericsson.se/mobitex

PALM-SIZED BLACKBERRY READY FOR MARKET

RIM has unveiled a new and advanced version of its popular wireless handheld e-mail device that is geared for the PDA (personal digital assistant) market. The new RIM 957 Wireless handheld delivers RIM's wireless technology in a sleek, palm-sized device with a large, crisp display. With a 32-bit Intel 386 processor, 5 MB flash memory plus 512 MB SRAM, it is one of the most compelling handheld devices on the market today. It comes equipped with a wireless Web browser and a more effective antenna than the existing RIM 950. As the first palm-sized wireless handheld to deliver "always on" performance with seamless corporate e-mail integration, it will also support Lotus Notes and WAP.

These improvements open the door to an even broader range of customers and advance RIM's leading position in the market for wireless e-mail solutions.

As one of RIM's early investors and technology partners, Intel recognized the eventual convergence of Internet and wireless technologies. With strong growth expected in both business and consumer interest over the next few years, Sean Maloney, senior vice president at Intel Corporation, calls the new device "a leading example of a new class of power-efficient Internet devices based on Intel architecture."

In February, RIM announced that it had entered a distribution agreement with Compaq to introduce BlackBerry to Compaq customers, which included participation in a customer roadshow in the US. "The introduction of RIM's new wireless handheld and BlackBerry 2.0 marks a significant milestone in our strategic relationship," relates Jerry Meeratz, vice president and general manager, Internet products and services at Compaq. "RIM has de-

livered a powerful wireless e-mail solution in an exciting, fully integrated design. Together, we are moving forward to deliver wireless solutions and services that will allow businesses to achieve enhanced communication and productivity."

RIM has also formed a strategic relationship with Neomar Inc. to provide a fully WAP-compliant microbrowser, powered by Neomar's WAP gateway, for RIM wireless handhelds and the BlackBerry e-mail solution. By implementing WAP on RIM wireless handhelds, Neomar can supply a more robust WAP browsing experience by taking advantage of the larger screen, graphics capability,

increased memory and user-friendly interface. A closed beta program is underway and announcements on the first customer deployments are expected this summer.

BlackBerry combines hardware, software and airtime to deliver single-mailbox integration and nationwide wireless service. The new BlackBerry 2.0

version offers several key features that include e-mail folder management, enhanced organizer features and upgraded server software for improved control and manageability. The Notes edition for Lotus Notes environments



will soon join the BlackBerry Exchange and Internet editions.

The RIM 957 is available in the US as of May 1, with a recommended retail price of USD 499. The wireless service will be priced at USD 39.99 per month for unlimited use with no roaming or long-distance charges. ■

www.rim.net

AWARDED FOR LEADERSHIP IN THE MARKETPLACE



While BellSouth officials at the Wave2000 conference were eager to let everyone know that 2000 will be "The Year of Wireless Data," a stunning collection of awards show that BellSouth Wireless Data was working hard

during 1999 to consolidate its leadership and to drive the growth of wireless data to the next level. The US operator received no less than six prestigious awards for 1999.

○ *PC Computing 1999 MVP Award* – As the top wireless data network for 1999. Runners-up for the award were American Mobile and AT&T Wireless. The editors of PC Computing cited BellSouth Wireless Data for letting users tap

into a world of wireless information whether using a pager, wireless modem or wireless PDA.

○ *Wireless Week 1999 Excellence Award* – Messaging

○ *The Frost & Sullivan 1999 Market Engineering/Market Strategy Award*.

○ *Microsoft 1999 Mobile Data Challenge*.

○ *Mobile Insights' 1999 Mobility Award*.

○ *Field Force Automation 1999 Customer Interaction Award*.

As this impressive lists shows, BellSouth Wireless Data has been judged on a wide range of criteria and found to be outstanding in every respect. If the wave is still gaining strength, as BellSouth officials so confidently predict, then hold on. It's going to be an even more exciting ride in 2000. Research In Motion Limited also has won several awards for its RIM Inter@ctive Pager 950. ■

AOL HELPS BRING WIRELESS TO THE MASSES

Millions of subscribers to America Online, the world's leading interactive services company, will soon be able to access their AOL e-mail accounts and use Instant Messenger applications when away from their desktop PCs. AOL recently introduced its "AOL Anywhere" strategy, which will bring the company's most popular features and services to a range of wireless devices.

with Nokia, Sprint PCS, Motorola and Arch Communications. Accordingly, the new AOL Mobile Messenger service will extend AOL Mail and AOL



week to an hour per day using these services.

AOL's embarkment into the wireless frontier will help broaden the consumer base for the mobile data market. Approximately 70 percent of all AOL households own a cell phone, pager or both, which is twice the penetration of the population as a whole. The wireless revolution is no longer part of the distant future – it is happening now. The Internet is fueling an explosion in the use of mobile phones and wireless handheld devices that would otherwise have taken much longer to gain momentum.

number that is sure to rise sharply as wireless use increases.

Interactivity, convergence and mobility are critical pieces of the new networked world.

As Steve Case explains, "Once people get a taste of it, they will expect even more. We believe that our AOL Wireless strategy will allow us to truly 'grow the pie', driving increased consumer demand, higher use of existing services and a range of new services based on these technologies. At every level, this is a win-win opportunity for AOL, for our partners, and for consumers." ■

www.aol.com

"Once people get a taste of it, they will expect even more. We believe that our AOL Wireless strategy will allow us to truly 'grow the pie.'"

Instant Messenger to RIM's AOL-branded, customized handheld wireless devices over the BellSouth Intelligent Wireless Network.

In just five years, AOL has grown from one million to more than 23 million members, plus tens of millions of consumers for the company's Web-based brands. According to AOL's CEO, Steve Case, one hundred million people around the world communicate with AOL Instant Messaging and ICQ. And AOL members have gone from spending an hour a

The partnerships with RIM, BellSouth and others will enable AOL customers to access their usual services, such as e-mail, buddy lists, stock portfolios and personalized news and sports whenever and wherever they choose. AOL already handles more than 900 million messages each day, a

As part of this strategy, AOL has entered into alliances with several leading companies in order to bring a comprehensive range of choices for mobile interactivity to its users. Agreements were recently signed with BellSouth Wireless Data and RIM, as well as

EXPANSION AND NEW OWNERSHIP FOR INTEC

Communication Networks Interface (CNI) is the new majority owner of Intec Telecom, the South Korean Mobitex operator. New management includes Won Baek, president and CEO, San un Yoo, executive managing director for marketing and sales, and Kun Ho Chooi, executive managing director and chief financial officer.

CNI, which will change the Mobitex operator's name in the near future, has charted an ambitious expansion strategy for the next three years. Plans for next year call for launching a number of financial services, including stock trading, insurance, cyber-banking and card authorization, as well as wireless

e-mail and PIM (personal information management) services in the Seoul metropolitan area. The company is currently testing its own PDA/two-way paging device, which will be marketed both domestically and abroad.

The new Korean network owner plans to expand coverage

both in the capital city of Seoul and in five other cities. The first new base stations will be installed later this year. A total of 600 new base stations will be installed nationwide over the next two years. ■

www.cni.co.kr

OPERATOR PROFILE: ST MOBILE DATA 24

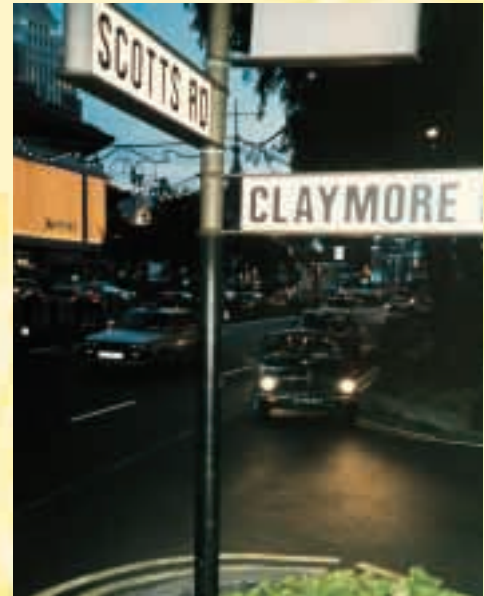
Singaporean Mobitex operator ST Mobile Data has pioneered a number of innovative applications. The most recent, and perhaps the most impressive to date, is TrafficScan, an intelligent transport system developed by the Land Transport Authority that uses Mobitex and satellite technology to provide drivers with real-time traffic information.

GO AMERICA 26

Putting now in knowledge.

OUTLOOK: FACING GPRS 30

Bengt Didner, who previously worked with Mobitex technology and is now product marketing manager for GPRS at Ericsson's newly formed Core Networks Mobile Systems product unit, shares his views on the opportunities and threats for Mobitex as GPRS services are launched by the world's cellular operators.

**32****WANDA WAVE**

Feeling slightly mischievous, Wanda finds herself imagining a world in which wireless data makes everything work better.

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Ericsson links

Ericsson www.ericsson.com

Ericsson's website for Network Operators:

www.ericsson.com/wireless

Ericsson Mobile Data Design www.ericsson.com/mobitex

Mobitex operators & associations featured in this issue:

BellSouth Wireless Data, US: www.bellsouthwd.com

Intec, Korea: www.intectelecom.co.kr

RAM Mobile Data, Netherlands: www.ram.nl

RAM Mobile Data UK: www.ram.co.uk

ST Mobile Data, Singapore: www.stmd.st.com.sg

Telia, Sweden: www.mobitex.telia.com

Companies and organizations featured in this issue:

AOL, US: www.aol.com

CNI, Korea: www.cni.co.kr

Copenhagen Airport, Denmark: www.copenhagenairport.com

Digital path, US: www.digitalpaths.com

GoAmerica, US: www.goamerica.com

KPN, Netherlands: www.kpn.nl

Land Transport Authority, Singapore: www.lta.gov.sg

Lipman, US: www.lipmanusa.com

Melard, US: www.melard.com

Mobitex Operators Associations: www.mobitex.org

Neomar, US: www.neomar.com

Normadic Communications, Australia: www.nomadicglobal.com

Orbcomm, US: www.orbcomm.com

Palm Inc, US: www.palmpilot.3com.com

Panasonic, US: www.panasonic.com

Research In Motion RIM, Canada: www.rim.net

Teklogix, Canada: www.teklogix.com

Verifone, US: www.verifone.com

GROWING TOGETHER

“United we stand, divided we fall,” is an apt slogan for the Mobitex industry at this point in time. As 2000 develops into “The Year of Wireless Data,” the interactive space is a sweet spot in the market with tremendous growth potential. As attendees at the recent Wave2000 conference learned, no company will be able to exploit this potential on its own. Instead, partnerships are more important than ever for rapid growth.



"It takes time to build strong partnerships, and doing so almost invariably requires working on concrete projects together."

The Wave2000 conference held in San Diego, California on March 13 to 15, 2000 was billed as a wireless alliances and vision exchange. The conference comprised three days of intensive activity as more than 650 participants exchanged ideas, forged new relationships and discussed business deals.

Previously, this annual event had primarily targeted a smaller community of developers and featured somewhat more technically oriented presentations. This year, however, the audience was expanded to include a greater number of industry leaders and end users, and participation soared to a record number of more than 650 attendees. Although there were plenty of sessions for developers and more technically interested participants, there was a new focus on business partnerships and successful solutions. Not only was attendance up dramatically over last year's event, both the number of industry-leading sponsors and speakers set new records at Wave2000.

"2000 has been proclaimed 'The Year of Wireless Data,' and reflective of that fact, this year's gathering of attendees and industry-leading sponsors is larger than ever before," noted BellSouth Wireless Data president and CEO William F. Lenahan in his opening speech. "Leading companies are moving to capitalize on the explosive growth of wireless data and are now developing products and services that will change the way we live and work."

SWEET SPOT IN THE MARKET

Strong partnerships were a recurring theme at the conference, and speakers were nearly unanimous in their assessment that fully leveraging this explosive wave of growth is not possible for any company acting on its own. Not surprisingly, conference hosts BellSouth Wireless Data, as well as most sponsor companies, announced new strategic partnerships at Wave2000. BellSouth's announcements included new agreements with America Online and Sun Microsystems, as well as a new alliance for wireless applications services.

Less visible but arguably more important than these attention-grabbing announcements were the countless meetings held outside the conference sessions. Through these meetings and in thousands of informal discussions during the three-day event, Wave2000 was truly a wireless alliances and vision exchange in which everyone could be a winner.

As BellSouth Wireless Data has constantly emphasized over the past two years, and Bill Lenahan repeated in his opening address, the interactive segment is the sweet spot in the wireless data market and a largely unexploited space with tremendous potential for those in the right place at the right time. For new attendees in particular, who were able to witness firsthand the excitement of the new generation of interactive applications for Mobitex, Wave2000 was definitely the right venue and perfectly timed to help them exploit this potential.

RECIPE FOR SUCCESS

Over the next 12 to 18 months, we will see the fruits of many of the partnerships that were formed at Wave2000. What is not immediately apparent to all, however, is that bringing the wireless data industry in general, and Mobitex in particular, to the point where tremendous potential exists and it is finally possible to talk about horizontal or mass markets, has required many years of hard work and close cooperation between equipment suppliers, network operators, hardware and software vendors, systems integrators and, not least, customers and end-user companies.

The business partnerships presented in this issue of Mobile Data Magazine are just a few of the many success stories that have broken ground for the new alliances and partnerships that were formed or announced at Wave2000. Some of them have been collaborative projects in which a hardware vendor, a software vendor or systems operator, and the network operator join forces to deliver a solution for the customer. The new logistics system being installed at Copenhagen Airport is one example of such a classic partnership, in which Teklogix and Ericsson worked together to develop a world-class solution. This partnership also includes a joint marketing agreement that is expected to result in significant business for both companies in the future.

As we go forward and create the wireless Web, new types of partnerships are being formed which include not only traditional players, but also service providers offering competing carrier technologies and content providers offering a wide range of information and business and personal services. These can perhaps be regarded more as alliances in which "coopetition" is an inevitable element. Managing these relationships will require a new business strategy. GoAmerica, whose business

strategy is described elsewhere in this issue, provides an excellent example of how to succeed in this new business environment.

REWARD IN PROPORTION TO EFFORT

However much the landscape changes, some things must remain the same. Successful partnerships must be focused on the customer and on delivering solutions that create value for the customer. Demands on suppliers are also increasing, meaning that customers want stronger partners, turnkey solutions and one-stop shopping. This is true whether the customer is an airport operator purchasing a logistics systems or a consumer signing up for a wireless Web service.

Successful partnerships must also be based on mutual respect for the other party's contribution and fair reward for the effort expended. If we recognize that no one company on its own will be able to leverage the explosive growth occurring in the wireless data market, then each party in a partnership must also accept that the other party's contribution is an essential component in the total solution.

In sharing his experiences from building the new Software and Services Group at RAM Mobile Data UK, David Wellbelove makes these points very clear. It takes time to build strong partnerships, and doing so almost invariably requires working on concrete projects together. In the end, a fruitful partnership must also reward each party with revenues in proportion to the contribution made. ►

“Successful partnerships must be focused on the customer and on delivering solutions that create value for the customer.”

FOCUS MORE IMPORTANT THAN EVER

As the wireless data world expands and the Internet continues to change everything, Mobitex operators, equipment suppliers, hardware and software vendors and systems integrators will face new challenges, forcing them to form new partnerships and to make strategic business decisions based on the new market conditions.

In facing these new market conditions, however, it is also important to recognize strengths and weaknesses. If there is a sweet spot in the market for interactive applications, this is a significant opportunity for Mobitex, because it plays to the technology's strengths. Interactive applications demand fast responses, “bursty” data exchanges and highly reliable two-way data communications, which are all defining characteristics of Mobitex technology. Conversely, the new generation of interactive messaging, information and e-commerce appli-

cations that Mobitex enables is creating a new lifestyle that is appealing to a growing number of users.

“It is more important than ever that we remain clearly focused,” emphasizes Folke Bergqvist, director of technology at Ericsson Mobile Data Design. “There will always be users and applications that need more or less than Mobitex can provide. One size does not fit all, but we can deliver world-class solutions that meet most wireless data needs.”

In the Mobitex industry, delivering solutions that satisfy the customer will invariably demand successful partnerships. Creating these partnerships requires focusing clearly on customer value, contributing core expertise that is an essential part of the solution and being rewarded in proportion to that contribution and the value created. Combining these three key ingredients in successful partnerships not only results in greater customer benefit and satisfaction. It also expands the market by breaking new ground and creating new opportunities. ■



JOINING FORCES FOR THE PUSH-BACK

Feeling the gentle nudge indicating that his plane is being pushed back for take off, Knud Pedersen breathes a sigh of relief. It's 8:29, and his flight is leaving the gate at Copenhagen Airport one minute ahead of the scheduled departure. He has a tight connection in London for his flight to Brazil, but that won't be a problem now. He'll make it to the meeting in Rio that had to be called at the last minute, and the tender that he and his colleagues in Brazil have been working on for nearly a month will be submitted on time.



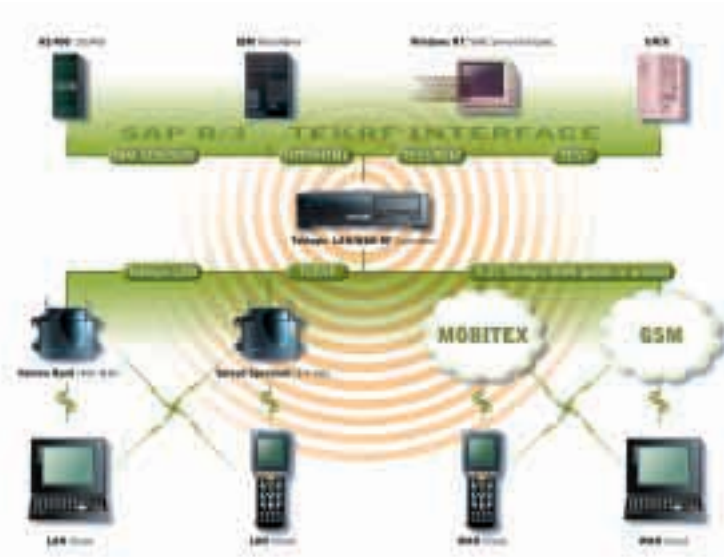
Getting people to their destinations on time is one of the most critical factors for customer satisfaction for any airline. Unfortunately, few passengers are aware of the many services that must be performed before a flight is ready for push-back or that the airline they are flying may not be directly responsible for many of these services.

Perhaps passengers with demanding schedules can be forgiven for their single-mindedness in viewing punctuality as the most important performance parameter for airlines. Looking behind the scenes at the logistics required for performing the services that will ensure an on-time departure, however, provides an excellent illustration of the power of wireless data communications and its ability to facilitate cooperation between service partners.

DEMANDING ENVIRONMENT

Few environments are as demanding for a logistics and communications system as a busy airport. Copenhagen Airport, which serves as the Northern European hub for SAS and its Star Alliance partners, is busier than most. It is also the site for an ambitious large-area logistics system developed by Teklogix and delivered in cooperation with Ericsson.

The numerous services that must be performed before a plane can take off range from catering and cleaning, to maintenance, fueling, baggage handling and passenger check-in. In each case, there may be several components to the service that must be performed correctly to ensure an on-time departure. Adding to the complexity is the fact that the services are provided by a large number of companies, many of



which are not directly linked to either the airline or the airport operator which are the purchasers of the service.

Copenhagen Airport is fairly typical in that the airport operator takes responsibility for virtually all services except airline operations and sub-contracts various suppliers for the services that it does not supply itself.

A PRAGMATIC SOLUTION

“One set of problems involves mobile workers within terminal buildings where operators have already learned the immense value of wireless LAN systems,” notes Philippe Beaulieu, director for wide-area wireless solutions at Teklogix. “These systems employ rugged, easy-to-use wireless terminals that allow workers to exchange data with a host system in real time.

Mission-critical information about the movement of goods, the status of services, etc. can be sent and received instantly, making them ideal for hot spots, such as baggage reconciliation, where frequent data transmissions are necessary.”

Wireless LAN systems of this kind have long been a Teklogix stronghold. The Canada-based company supplies a full range of ruggedized terminals, wireless LAN equipment and controllers for interfacing to host systems. In addition, the company’s software is SAP-certified, allowing the wireless data system to be interfaced to the popular R/3 system on the host side.

“Vehicle-borne staff and those working in hangars, supply depots, kitchens and other facilities spread across a large area pose another set of problems,” continues Philippe. “The integration of a private wireless WAN and the existing LAN presents a pragmatic solution. Not only can an immediate overview of all airport operations be obtained, but the transmission of



TEKRF™ – INTEGRATION COMPONENTS FOR SAP™ R/3® SYSTEMS

Developed exclusively for SAP R/3® warehousing, manufacturing and distribution environments, TekRF solutions extend the full functionality of R/3 systems to mobile workers

throughout an enterprise. Featuring a comprehensive suite of standard transactions, TekRF provides a seamless link to SAP’s warehouse management, inventory management and sales and distribution functions. TekRF enables bi-directional data to move between R/3 applications and Teklogix’ RF hand-held or vehicle-mount computers to supply mobile workers with up-to-the minute information and instructions such as inventory status or work

TEKLINK CLEAR. FAST. FAR.

real-time data over a private Mobitex network to a host system means that operations are planned as they occur. The payback in increased productivity, accuracy, fewer costs and timeliness is immense.”

FOUNDATION FOR PARTNERSHIP

Such an integrated LAN/WAN system for wireless data communications is the foundation for the partnership between Teklogix and Ericsson and for the system now being taken into operation at the Copenhagen Airport. Initially, the installation will comprise 240 Teklogix 7035 handheld computers and a private Mobitex network using only two base stations to cover the airport's 30 square kilometers. The Teklogix software and proprietary controllers link the wireless terminal to Copenhagen Airport's SAP R/3 enterprise system. Particularly important for the customer's choice of the Teklink solution was Teklogix' TekRF technology which is described below.

Copenhagen Airport is now actively marketing the new wireless services to its sub-suppliers and expects to add as many as 450 wireless terminals over the next year for such applications as gate control and baggage handling. “This solution meets our current and future needs. The integration of Teklogix' unique hardware and software expertise with our SAP R/3 system will be a significant contributor to Copenhagen Airport's future development,” concludes Jan Moller Hartvig, logistics manager at Copenhagen Airport. ■

www.teklogix.com

orders. TekRF solutions are proven, quick to deploy and can be rolled out in tandem with the SAP implementation, or easily integrated after R/3 goes live, to dramatically improve production environments.

As material management specialists within the SAP Supply Chain solution, Teklogix has over 80 TekRF installations worldwide, including many Fortune 500 companies with multi-divisional, multinational systems.

EXTENDING THE SUPPLY CHAIN

The supply chain is growing in scope as it extends to include more and more activities and increasing its impact on the bottom line. To meet these challenges, Teklogix teamed up with Ericsson to provide the industry's first wide-area wireless solution based on Mobitex technology.

The result is Teklink, a powerful extension of corporate or wireless LANs that leverages both private and public Mobitex networks. This is a solution for wide-area and large-area logistics that extends the wireless LAN-based supply chain and inventory management systems that have long been a Teklogix stronghold to such operations as airports, ports, rail yards, transportation, distribution, manufacturing and raw materials extraction.

“Teklink is the fruition of our WAN development project with Ericsson and marks Teklogix' entry into the wireless WAN market. With Teklink, we are building on our traditional strength in wireless LAN logistics solutions and expanding into new markets,” says Ian McElroy, president and CEO of Teklogix Inc.

REAL-TIME DATA DELIVERY

Timely delivery of information is a critical aspect of efficient supply chain management. An efficient logistics system must therefore not only handle physical processes, such as purchasing, production, warehousing, transport and delivery, but also track the information associated with these activities as they occur.

Throughout the supply chain for delivery of airport services, for example, the information gathered by a logistics system is used by a variety of parties for multiple purposes. Maintenance engineers servicing aircraft need to know the availability of spare parts. Baggage handlers need to be informed of flight arrivals in order to unload bags quickly. Ground service managers and gate agents need to be able to plan work loads and manage arrivals and departures. Catering companies expect just-in-time delivery of meals

from airport kitchens. On-time departures therefore demand not only knowing when services will be delivered, but being continuously informed about delivery status and unexpected delays.

In many cases, the data associated with the activities managed by a logistics system is generated locally but needs to be available globally, across the entire supply chain. For a large area, such as an airport, adding a Mobitex wireless WAN for real-time communication with a host system provides many benefits, not the least of which is being able to obtain an overview of all operations. When real-time data is transmitted over a Mobitex wide-area network to a host system, costs can be reduced and efficiency increased by planning operations as they occur.

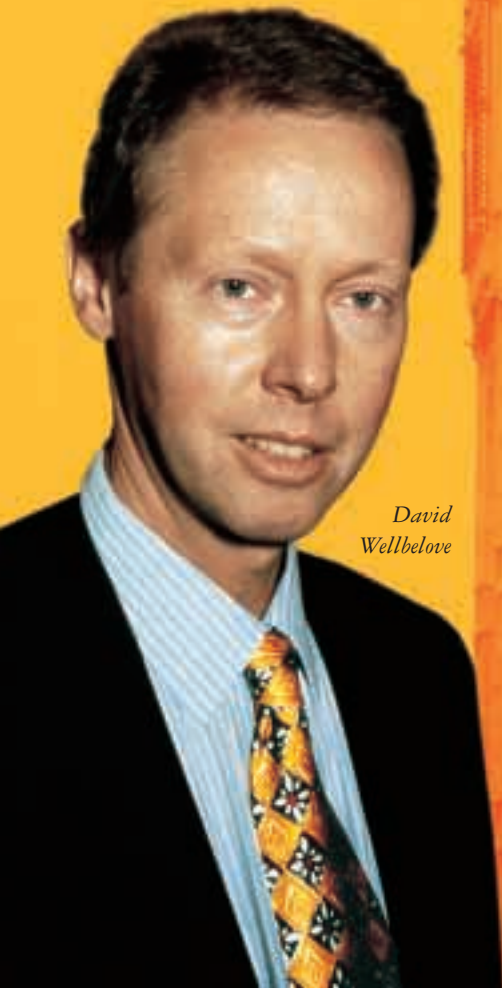
KEY STRATEGY FOR THE FUTURE

Copenhagen Airport is the first global customer to implement a private Mobitex network in a Teklink solution. In the first phase of implementation, Copenhagen Airport will extend its wireless network to provide real-time logistics to maintenance staff across the entire airport. Gate control and baggage handling will be added in the near future. The airport operator is also actively marketing real-time logistics services to other companies providing services at Copenhagen Airport.

The Copenhagen Airport contract is an important first for the Teklink concept and a huge win for both Teklogix and Ericsson. The new contract is not only the result of more than a year of joint development and marketing on the part of Teklogix and Ericsson. It is an important reference for future projects.

“Marketing total solutions jointly with business partners like Teklogix is our most important strategy for the future. We see an excellent window of opportunity in the market over the next few years for wide-area and large-area logistics solutions in such areas as ports, distribution operations and raw materials extraction, and Teklink is a perfect solution for exploiting these opportunities,” says Lars Wallström at Ericsson Mobile Data Design.

BUILDING BUSINESS ON TRUST



*David
Wellbelove*

Building successful partnerships and winning customers is a question of trust. Few people are more aware of this than David Wellbelove, who is the director of the new Software and Services Group at RAM Mobile Data UK. “Previously, we were viewed both internally and by customers and partners as a technical resource pool,” notes David Wellbelove, who is the chief architect behind the new unit. “With the creation of the Software and Services Group, we are realizing a model in which we will offer the full range of skills required to deliver solutions, from scoping of customer requirements to testing and user training.”

The new unit, which is a separate profit center within RAM Mobile Data UK, consists of functions for business development and bid management, systems design and consulting, project management services, systems integration and testing, and training. By offering services to customers at different stages of a project, each of these units will contribute to overall revenues.

EARNING REVENUES SOONER

“By creating this unit, we expect to generate more revenues during the initial stages of customer projects,” explains David. “With the previous organization, revenues for us as the operator often were not generated until the application went live, meaning that it was up and running and generating traffic. In most customer projects, this does not occur until a rather late stage.”

In the past, the technical resource pool was made available at no cost during the early stages of a customer project. David Wellbelove admits readily that management viewed this as wasteful and that one of the primary objectives in creating the new Software and Services Group was to increase profits by earning more revenues at the early stages of a project. Getting to the point where this was possible, however, has taken some time.

“We would have liked to have done this two or three years ago, but it was not possible at that time,” notes David. “In part, this was because it was first necessary to get customers used to the idea of paying market rates for services. Software companies routinely charge for their services, but we in the telecom industry have not done so in the past. Correcting this mistake takes time.”

LEVELING THE PLAYING FIELD

Equally important has been to anchor the new strategy with the Mobitex operator's business partners, which in many cases offer similar services. Although at first glance, it might seem that RAM Mobile Data through the Software and Services Group is competing with the

system integrators and software vendors that have helped to create wireless data solutions for its customers, this is in fact not the case.

“This initiative has been very well received by our business partners,” says David. “In most cases, it was welcomed, and our partners regard our organization as more professional today. Many of our partners consider it to be more equitable and that it levels the playing field.”

As a case in point, David cites ADP, a software solutions provider and a long-standing RAM partner. Together, the two companies have supplied most of the wireless systems to police forces around the country for linking them to the National Police Computer. RAM Mobile Data is the preferred supplier for wireless communications, but ADP had previously most often been responsible for project management. Today, either company can take the project management role, depending on the customer's requirements and preferences.

“This type of partner relationship takes time to establish and requires working together on concrete projects,” observes David. “Each company must be realistic about what it can provide. There must also be a reasonable share of revenues for each party. You have to deliver together to win together.”

SEEKING NEW OPPORTUNITIES

A strategic partnership that will be important for the future was recently established with BT Cellnet. RAM Mobile Data UK previously partnered with the British cellular operator to offer the BT Replymaster two-way paging service, which met with limited success. The new partnership, however, was in many respects enabled by the new Software and Services Group.

“Partnering with BT Cellnet is completely in line with our Outernet concept, which supports internetworking between our Mobitex network and GSM and satellite systems,” says David. “We strive to deliver total solutions in which Mobitex may be only a part. As other technologies such as GPRS emerge, we must adapt to market realities.”

In RAM's view, GPRS will be a factor in the marketplace, but it is not sufficiently resilient for the mission-critical applications for which Mobitex is best suited. Rather than reacting to a perceived threat, however, David

Wellbelove believes that the British Mobitex operator should be proactive in seeking new opportunities through the BT Cellnet partnership.

“One area where many operators fall down is support,” he notes. “Customers want end-to-end wireless data solutions, and they want a support organization that understands the entire application. With our new organization, this represents a significant opportunity for us.”

STEP-CHANGE IN THE MARKET

Moving from being a network service provider with a technical resource pool to becoming a total solutions provider with a professional software and services organization is a long and difficult process. Nonetheless, it is one that all Mobitex operators must face.

“This is a step-change in the marketplace. Large customers in particular want strong partners and total solutions. We must create the right expectations about what we can do and identify the added value that we can deliver to the customer,” concludes David Wellbelove. ■

www.ram.co.uk

“Each company must be realistic about what it can provide. There must also be a reasonable share of revenues for each party. You have to deliver together to win together.”

WHERE QUALITY AND SERVICE ARE KEY

The multifaceted nation of Singapore is the hub of South-east Asia. The country has a diverse population with four official languages and three ethnic groups that coexist on a small island at the tip of the Malay Peninsula. Lacking in natural resources, it has many special characteristics shaped by its history and the need to find alternative means of survival and prosperity.

VITAL STATS ON SINGAPORE

| | |
|----------------------------|--|
| <i>Land area:</i> | 648 sq km |
| <i>Population:</i> | 3.5 million |
| <i>Main ethnic groups:</i> | Chinese 76.5%, Malay 14.9%, Indian 6.5% |
| <i>Languages:</i> | English, Malay, Mandarin, Tamil |
| <i>Currency:</i> | 1 Singapore dollar = USD 0.60 |



Singapore's compact size belies its economic growth. In just 150 years, Singapore has grown into a thriving center of commerce and industry, having been a trading station for the British Empire in the 19th century. One of the world's busiest ports with more than 600 shipping lines, it is also a major oil refining and distribution center. Singapore has a substantial manufacturing base and is a major supplier of electronic components. The nation is also renowned for its excellent transportation services; its airline, for example, is consistently voted to be among the best in the world. Singapore is also one of the most important financial centers of Asia, with more than 130 banks.

Singaporeans work hard to offer services that are world-class, a characteristic that permeates many aspects of their society, particularly when it comes to infrastructure and communications. Customers demand the highest quality at all times and have low tolerance for system failures and operational malfunctions. This can be very challenging for global suppliers trying to maintain a foothold in the Singaporean market, but if successful, can be an invaluable reference for future business.

Singapore Technologies is a business group with companies operating in the fields of engineering, telecommunications, electronics manufacturing and infrastructure. Singapore Technologies Telemedia, the group's telecommunications arm, is active in areas that include paging, trunked radio and mobile data, which is a relative newcomer to its operations.

ST Mobile Data (STMD) is a joint-venture company formed by Singapore Technologies and Comfort Group Ltd. In June 1994, the Telecommunications Authority of Singapore awarded STMD the license to operate a public wireless data network. Seven months later in early 1995, STMD launched its commercial two-way wireless data service based on Mobitex technology.

ST Mobile Data's choice of Mobitex as its carrier technology was no compromise on quality. Since its introduction, the network has expanded to provide more than 99% street-level coverage, as well as up to 15 km from Singapore's coastline. It is this full coverage that enables STMD to provide a broad range of innovative applications that can be used nationwide. The STMD network has among the highest per-node traffic rates in

the world. It was therefore upgraded in 1999 to enable even greater switching capacity.

Major customers include PowerGrid (vehicle tracking system), Shell International Eastern Trading Co. (sales order dispatch system for floating barges), Comfort Transportation (CabLink taxi dispatch system), and Land Transport Authority (remote message display and information transfer for intelligent transport systems – see following article). Other applications for which the STMD network provides services include remote elevator monitoring, database access, fleet dispatch and fleet management systems.

An important part of STMD's operations is providing consulting services to develop and implement solutions, both for existing and potential customers in Singapore and abroad. The company was recently awarded a consulting assignment for PT Massinfo Nusantara, the Indonesian Mobitex operator. Turn the page to read more about how STMD works with existing customers to develop new integrated applications.

"Singaporeans work hard to offer services that are world-class, a characteristic that permeates many aspects of their society, particularly when it comes to infrastructure and communications."

As the first telecom operator to provide an alternative to the nation's incumbent operator, STMD's commitment to reliable, cost effective and innovative services has made it the market leader for wireless data communication services in Singapore. ►

www.stmd.st.com.sg

*From left: Liu Meng Wong, Director Sales, ST Mobile Data Pte Ltd
Ian Tob Kim Chwee, Project/Product Manager, Ericsson in Singapore
Cheng Theng Chye, Asst. General Manager, ST Mobile Data Pte Ltd
Lim Howe, Account Manager, ST Mobile Data Pte Ltd*



TRAFFICSCAN KEEPS A WATCHFUL EYE IN SINGAPORE

Renowned worldwide for its clean and efficient transportation systems, Singapore seems to spare no effort when it comes to improving traffic and transportation conditions for the city-state's inhabitants. The Land Transport Authority (LTA) of Singapore recently launched a new intelligent transport system called TrafficScan, which uses Mobitex and satellite technology to collect and disseminate traffic speeds on arterial roads throughout the island. The LTA realized that it could take advantage of the natural circulation of some 7,500 taxicabs, which were already equipped with Mobitex transceivers, in order to pinpoint traffic jams and alert motorists of delays. The application was then developed in collaboration with ST Mobile Data.

By using GPS technology, the taxis, which are operated by Comfort, Singapore's largest taxi company, transmit information to LTA's TrafficScan control center on their locations and speed, as well as the directions in which they are traveling. To calculate the average speed of traffic on a particular road, TrafficScan only processes data obtained from taxis carrying passengers. This is because the data from taxis without passengers (such as those queuing at taxi stands or cruising for fares) is not indicative of actual traffic conditions.

TrafficScan then proceeds to publish the information on its website, which features a general map with roads that are color-coded according to a traffic speed range. Potential trouble spots, or all roads and intersections where speeds are slower than 20 km/hr, are listed. The information is updated every two to five minutes, so visitors to the site can find out the extent of the jam and the approximate traffic speed of the road in question.

Motorists can also type in the name of up to 338 roads to find out the traffic conditions. Once the name has been entered, TrafficScan displays a map of the road and its surrounding area. Alternatively, motorists can search by geographical area or suburb.

TrafficScan information is also made available to Radio Corporation of Singapore (RCS) and Safra Radio. The presenters and disc jockeys of these radio stations use the TrafficScan data to supplement their ordinary traffic reports.

A spokesman for RCS views TrafficScan as an important complement to the station's Traffic Watch program. "Traffic Watch depends on motorists to report traffic conditions and road incidents, and is only effective if there is feedback. Now, the radio DJs can use TrafficScan to spot potential problem areas first and then invite motorists to call Traffic Watch with more details."

BENEFITS ARE THREEFOLD

The central benefit of TrafficScan is that it enables drivers to better plan their routes or times of departure in order to avoid congested areas. An obvious time-saver for motorists with busy lives, it also may relieve some traffic problems in the long run – or at least prevent some hot spots from boiling over.

From an infrastructural perspective, TrafficScan provides more sophisticated monitoring of the city-state's crowded roadways. Even though Singapore's traffic is not nearly as nightmarish as in many other Asian cities, the volume of vehicles on any given day is significant, with low speeds during rush hours.

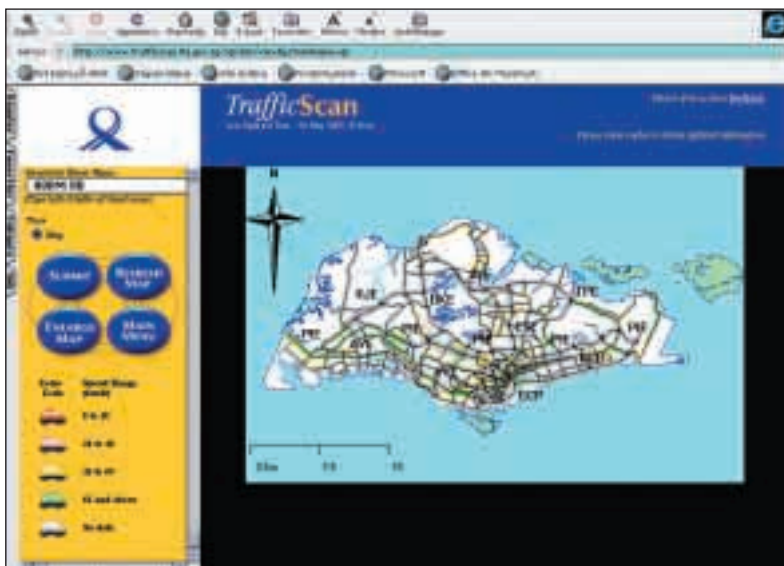
As with any system that either limits or controls traffic congestion, there are environmental benefits as well. By limiting the amount of time that cars spend at a standstill or a slow crawl with their engines running, emissions can be reduced, improving air quality for pedestrians and residents.

One of the only shortcomings is that no information is available where there are no taxicabs, but these areas generally don't suffer from traffic congestion. Nor does the system provide the reason for a back-up. This type of information is dependent on feedback from drivers.

ADVANCED INFRASTRUCTURE

In a country where the inhabitants have exacting standards and expect everything to work perfectly, TrafficScan is an important part of Singapore's otherwise excellent traffic logistics.

The mission of the LTA is to provide Singaporeans with world-class ground transportation, which encompasses infrastructure for both private automobiles and public transportation. For decades, the LTA has been striving to provide highly efficient and cost-effective systems to solve the traffic problems faced by all major modern cities. LTA recognizes that simply building a comprehensive network of roads and expressways is, in itself, not enough to ensure a smooth flow of traffic.





The LTA realized that it could take advantage of the natural circulation of some 7,500 taxicabs, which were already equipped with Mobitex transceivers, in order to pinpoint traffic jams and alert motorists of delays. The application was then developed in collaboration with ST Mobile Data.

The advanced traffic management systems currently in use harness the latest technology to maximize road network capacity. In addition to TrafficScan, the Expressway Monitoring and Advisory System (EMAS) also uses Mobitex technology to send messages to sign boards to inform motorists of road incidents that can cause major blockages.

EMAS was first implemented along the Central Expressway in the spring of 1998 and uses a series of high-tech cameras to detect accidents or other conditions that may hinder traffic flow. Once an incident is detected, control center staff take appropriate measures, such as alerting the traffic police or emergency services, as well as television and radio stations, which assist in forewarning other motorists. Warning messages are also displayed on electronic signboards along the expressway. During 2000, EMAS will be extended to other major expressways. Motorists can currently obtain traffic information on all expressways through the TrafficScan website.

Another important part of Singapore's holistic approach to traffic management is the Green Link Determining (GLIDE) system, which controls traffic signals by allocating more "green time" at intersections where traffic flow is heavier, based on real time traffic volumes. The GLIDE system was recently extended throughout the island to encompass more than 1,250 traffic signals.

Electronic Road Pricing (ERP) was introduced in 1998 and expanded in 1999 to replace the manual road pricing, or toll, system that had been in place since 1975. ERP is an intelligent system that uses electronic image cameras and smart-card technology to detect the entry of vehicles into the restricted zone of central Singapore and debit the driver automatically. All vehicles are fitted with a special unit on the

windscreen containing a cash card that the driver replenishes as necessary. This sophisticated system can detect and charge different rates for different types of vehicles and based on the time of day. It also photographs the rear license plates of violators and does not require vehicles to slow down or remain centered in one lane when passing under the gantry.

Together, these systems have had the effect of increasing accessibility on Singapore's roadways. Before ERP was introduced, for example, a somewhat negative attitude towards the traffic authorities prevailed due to the high cost of driving in Singapore, combined with frequent traffic jams. But frowns are increasingly turning into smiles as traffic conditions have actually improved, resulting in a greater willingness to pay road tolls. At the same time, tolls function as a deterrent to driving. Thanks to better traffic information and improved services, there is also more frequent use of public transportation.

THE FUTURE IS MOBILE

LTA is recognized worldwide as a leader in innovative traffic systems and, as such, it is always on the lookout for new technology that will enhance the services it provides. Mobile data technology is an important component in the evolution of Singapore's traffic management systems.

The next step is to enable access to services such as TrafficScan on mobile devices such as interactive pagers, WAP phones or PDAs.

This will allow motorists to obtain up-to-the-minute and highly accurate traffic information in their cars, in addition to information about public transportation, directions to special attractions, shopping areas and so forth.

Sounds like a perfect system? It quite possibly is – at least by today's standards, which in Singapore tend to be higher than average. While traffic authorities in many of the world's major cities are obsessed with building ring roads and adding expressway lanes, it should be noted that the technology used in Singapore can be deployed just about anywhere, with a price tag considerably below the cost of roadbuilding. ■

www.lta.gov.sg

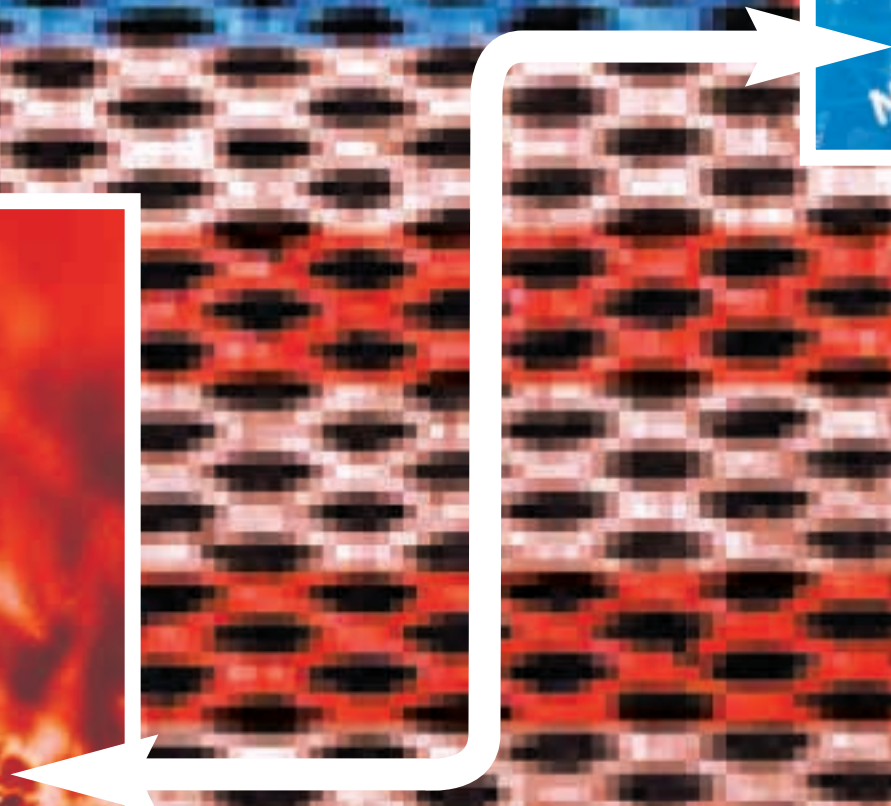
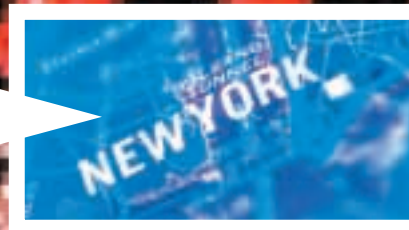
"LTA recognizes that simply building a comprehensive network of roads and expressways is, in itself, not enough to ensure a smooth flow of traffic."



GoAmerica

—PUTTING NOW IN KNOWLEDGE

Long before Internet portals or WAP, there was GoAmerica. Based on a daring vision and founded by some of America's wireless data pioneers, GoAmerica set out to do what is still somewhat of a holy grail within the industry: create the wireless Internet. While others are still testing technology and refining their business plans, GoAmerica has become an established brand.



STATE-OF-THE-ART SERVICE PLATFORM

What GoAmerica has accomplished seems so impossible that it might as well be magic. GoAmerica subscribers have truly useful wireless access to any website on the Internet, corporate intranets, corporate e-mail and e-commerce. They can choose from a wide range of wireless devices from interactive pagers and mobile phones to palmtop Windows CE or standard notebook PCs. They can also use virtually any wireless network currently available. GoAmerica is quite simply a total resource for wireless communications for people on the go.

"Our mission is to empower the individual," says Josh Rochlin, director of business development at GoAmerica, pulling out his interactive pager to demonstrate GoAmerica's service. "When I'm out of the office, don't just want messages or pages. I want a browser on my belt. I should have as much access on my hip as I have on my desktop."

Josh quickly punches keys with his two thumbs. Within seconds, we are connected to the Ericsson website. We can drill down in on the site to the Mobitex home page or any other area on the site. It's all there. The graphics are missing, of course, because the Go.Web software knows that the device cannot display them, but all the information on the entire Ericsson website is accessible. Yet, Josh vows that he has never visited the site before and that the information was not pre-loaded or pre-compiled in any way.

It really works. But how is it possible? If there are no smoke and mirrors, what is the secret behind this deceptively simple wireless Internet service?

GoAmerica's core strength lies in leading-edge technology. Although based on industry standards and existing technology, both the client and server-side software for the basic Go.Web service is proprietary and has been developed by GoAmerica. Go.Web technology provides flexible and reliable Internet service across a number of wireless networks and mobile device platforms.

On the client side, standard web browsers and e-mail software can be used. The Go.Web software works at the lower network, transport and device layers to optimize data communications across wireless networks. Supported platforms include the Palm OS, interactive pagers such as the RIM 950, Windows CE, Windows 95/98 and WAP (Wireless Application Protocol) phones. Supported wireless networks include Mobitex, CDPD, Ardis, CDMA and GSM.

Most of the magic happens on the server side at GoAmerica's Wireless Internet Connectivity Center (WICC), which includes the Go.Web Gateway. This gateway is based on a proprietary service platform that includes web page formatting, encryption, authentication and compression. The Go.Web compression technology and enhanced wireless transport protocol provides bandwidth efficiency and maximizes data transmission speeds. Industry standard SSL (Secure Sockets Layer) and internally developed encryption technologies ensure security through the Go.Web Gateway.

In addition to acting as the gateway to the Web for the wireless device, the Go.Web

Gateway provides access to other networks. For example, GoAmerica has licensed BellSouth Wireless Data's Interactive Paging Service (IPS) software and is one of the few companies to run its own IPS gateway, thus allowing GoAmerica subscribers to use the Mobitex operator's interactive messaging service. GoAmerica was also the first non-cellular carrier to license Phone.com's UPLink software and to deploy the company's WAP-compliant gateway to allow WAP phone users to access the Internet. In addition, GoAmerica subscribers can access corporate networks, intranets and e-mail systems, as long as they are accessible via an IP address. Authentication, SSL and encryption functions ensure that these connections are secure and that GoAmerica subscribers can access corporate data for which they have access rights from any location.

Naturally, the WICC, to which every GoAmerica subscriber connects, contains some pretty powerful hardware, too. This completely redundant data center facility, which is staffed around the clock, 24 hours a day, houses farms of clustered high-end servers, RAID disk storage arrays and a switched fiber-optic backbone. It is connected by redundant, high-speed leased T1 lines to multiple Internet backbone providers, which in turn connect directly to the backbone networks of the wireless operators with which GoAmerica has service agreements, thus ensuring that most subscribers can connect to Go.Web via a local wireless network.

A DARING VISION

The secret lies in leading-edge technology and industry-leading partnerships, but there is more to it than that. Making the seemingly impossible not only work but actually seem simple required a vision and many dedicated people who dared to do the impossible and were willing to put tremendous effort into making it work.

In autumn 1996, Joe Korb, who is now executive vice president of GoAmerica, resigned from his position as vice president for business development at RAM Mobile Data (now BellSouth Wireless Data). Joe and several colleagues, including Aaron Dobrinsky, president

and CEO of GoAmerica, and Alan Docter, an early-stage investor in technology companies and currently a director of GoAmerica, formed the fledgling company. At that time, the Internet was only starting to take off, and wireless Internet access really was an impossible dream. Yet these wireless data pioneers believed that they could build GoAmerica into a viable business as a wireless ISP.

"In truth, we're not quite there yet," admits Josh Rochlin. "GoAmerica has established a market-leading position and built a strong brand. The opportunity is there, but most of the challenges still lie ahead of us. Our ability to exploit the opportunity by meet the challenges that it presents will determine our ultimate success as a company."

INDUSTRY-LEADING PARTNERSHIPS

Providing a state-of-the-art technical platform for wireless Internet services is only a prerequisite for a compelling service offering. In establishing its position as a leading wireless ISP in the US, GoAmerica has forged partnerships with industry leaders in several sectors. These sectors include device manufacturers, wireless carriers and content and application providers, as well as channel partners, such as value-added resellers (VARs) and dealers.

"We really are completely neutral with respect to devices and carriers," explains Josh Rochlin. "We've established some very good

“Josh quickly punches keys with his two thumbs. Within seconds, we are connected to the Ericsson website. We can drill down in on the site to the Mobitex home page or any other area on the site.”

relationships, and we obviously think that some combinations work better than others. But we want to support what's out there and let people use the device and the carrier of their choice. Our business is not selling devices or carrier services, but rather offering access to a wealth of services that overcome the limitations of a single-function device or carrier service.”

For the moment at least, selling devices is in fact a part of GoAmerica's business. The wireless ISP offers a number of third-party wireless devices, including several wireless modems, the RIM 950 interactive pager and the Palm, as part of an initial service agree-

ment. Typically, these devices are discounted to cost or below, in much the same manner as cellular operators offer phones to new subscribers.

GoAmerica also has agreements with a number of wireless carriers and is able to resell airtime on their networks. These networks include BellSouth Wireless Data's Mobitex network, American Mobile's ARDIS network and the CDPD networks operated by AT&T Wireless Services and Bell Atlantic Mobile GTE Ameritech. In general, the company pursues a strategy of using third-party network providers in locations where it is most economical to do so. An advantage of this strategy is that when the economics change, GoAmerica is able to move its subscribers to different networks offering the same carrier service.

As an example of how GoAmerica forges agreements with content and application providers, the company recently signed an agreement with DLJ direct, which is a Web-based online trading company. GoAmerica subscribers will be able to open a DLJ direct account and begin wirelessly trading securities through Go.Web.

COMPREHENSIVE SOLUTIONS

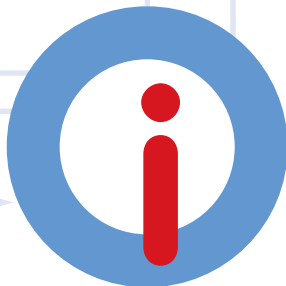
Leading-edge technology and industry-leading partnerships allow GoAmerica to offer very

compelling services for customers. The wireless ISP offers a number of service packages, all of which share some common traits. GoAmerica prides itself on offering easy-to-use, comprehensive and flexible service with superior customer care and technical support.

“We really do aspire to be a total resource for wireless communications,” says Josh Rochlin. “GoAmerica sets the standard for what users should expect of a wireless ISP in terms of ease-of-use, reliability and performance, and we stand behind that standard with our service and support teams 24 hours a day, every day of the week. Focusing on the customer and meeting customer expectations is what our business thrives on.”

Key features of GoAmerica's service plans are nationwide unlimited access fees, no roaming charges, access to multiple networks and a USD 100 rebate on hardware purchases. For occasional users or mobile professionals who prefer a pay-per-use price plan, GoAmerica offers the Go.Lite service plan, priced at USD 9.95 per month, while a Go.Unlimited plan is available for frequent users. Both plans include the Go.Web and Go.Mail services, as well as access to news, entertainment, stock quotes, travel and weather services.

A unique feature of the Go.Web service is that users are able to customize their personal website and create a personal portal. Through this portal, accessed via a separate Web address, users can go to their favorite website



“We want to support what’s out there and let people use the device and the carrier of their choice.”

quickly and customize how content will be displayed. In addition, the Go.Mail service supports a number of options allowing users to access e-mail at an existing Internet e-mail or business account, as well as a GoAmerica e-mail address.

For corporate customers, there are a wealth of options. GoAmerica can provide customized solutions to provide connections from its Wireless Internet Connectivity Center to corporate e-mail and database systems and intranets. Virtual private network and data hosting services are also available. In addition, GoAmerica offers a number of value-added services for specific customer segments, such as lawyers and stock brokers, and actively seeks partnerships with third-party suppliers to develop more such services. By offering custom-tailored solutions for specific business applications, GoAmerica opens the door to

wireless data communications for thousands of businesses that would otherwise not have the resources to develop their own solutions.

SETTING THE STANDARD FOR TOMORROW

What was once a dream is on the verge of becoming a commodity service today. Everyone is talking about the wireless Internet, and more and more companies are moving into the space in which GoAmerica operates. GoAmerica must always stay one step ahead of the competition. Naturally, this means continually improving the GoAmerica subscriber’s wireless experience by offering even more comprehensive and flexible solutions and superior customer service and technical support. Of vital importance going forward, however, will be to capitalize on marketing and branding initiatives and to expand the sales and distribution channels.

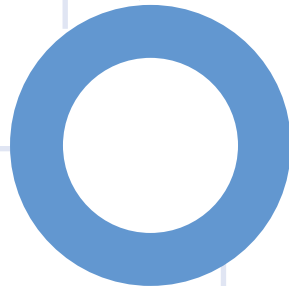
“Strengthening the GoAmerica brand and forging strong partnerships really go hand-in-hand,” notes Josh Rochlin. “We are actively seeking joint marketing agreements with third-party service, content and application providers in other industries in order to provide a more comprehensive offering for our subscribers. Securing such agreements with

industry leaders, however, requires a strong brand, a well developed channel program that includes VARs, dealers and agents, and a growing subscriber base.”

As the wireless Internet evolves, expect GoAmerica to remain on the forefront. Leading-edge technology, industry-leading partnerships, support for the broadest range of devices and networks in the industry, easy-to-use, comprehensive and flexible solutions and superior customer service and technical support make GoAmerica a total resource for wireless communications. GoAmerica is the wireless ISP that puts the now in knowledge and lets people take it on the road. ■

www.goamerica.com

“A unique feature of the Go.Web service is that users are able to customize their personal website and create a personal portal.”



MOBILE DATA NEWS

JAVA SHRINKS ITS FOOTPRINT

Sun Microsystems and Microsoft may not be talking to each other these days, but BellSouth Wireless Data is working with both companies to develop a bold new architecture for end-to-end wireless solutions. Key to the new architecture is the Java 2 Platform, Micro Edition (J2ME), which BellSouth is licensing from Sun.

In choosing an architecture for the wireless Web, BellSouth Wireless Data has evaluated both the WAP (Wireless Application Protocol) model backed by the cellular phone industry and the Palm.net model introduced for the Palm VII. The US Mobitex operator has chosen to promote an http Connectivity model

based on Web application servers, http (hypertext transport protocol), XML (eXtensible Markup Language) and Java, which is expected to be J2ME on wireless devices and J2EE (Java 2 Enterprise Edition) on Web servers.

The Microsoft connection relates, not surprisingly, to the ubiquity of Windows on both servers and portable computing devices. Microsoft is currently demonstrating a pre-beta version of a mobile Internet platform code-named Airstream that will be fully supported in the BellSouth architecture. According to the Microsoft design team, the overall objective of Airstream, which will be based on Windows

2000, is "to deliver a highly extensible system for moving Web data between servers and mobile end-points that will both application-enable devices and mobile-enable applications."

The BellSouth Wireless Data http Connectivity solution will be available later this year. The new architecture, which will be fully supported in development tools, such as BellSouth Powertool, will feature an http/Mobitex proxy server, integrated middleware and optimized security, thus offering an easy on-ramp to dot.com companies wishing to leverage the wireless Internet. Look for more details in a forthcoming issue of Mobile Data Magazine. ■

PALM MORE WAYS TO GET ON THE WEB

Thanks to two new WAP micro-browsers and a new PQA, browsing the Web with a Palm Pilot has become significantly easier and more flexible.

NEOMAR SUPPORTS MULTIPLE DEVICES

Neomar is a start-up company that intends to be a leader in WAP-based solutions for mobile devices. The company has developed WAP browsers for devices from both Palm and RIM. Neomar is focusing on delivering end-to-end WAP solutions for these devices.

www.neomar.com

TAKING ANOTHER PATH

Digital Paths takes another approach to providing greater access to the Web for Palm users. Rather than providing a WAP browser, the company has developed DPWeb DX, a PQA that connects to a Web gateway, thus providing an alternative path to the Palm.net website. The DPWeb DX PQA can be freely downloaded from the company's website.

www.digitalpaths.com

PALM COMPUTING

Palm Computing has joined the WAP Forum and announced that it will support WAP in future releases of the Palm Computing Platform. No dates were announced for this release, however. The company is also expected to continue supporting the highly successful Web clipping paradigm and maintaining the Palm.net website. ■

www.palmpilot.3com.com



THE KEYLESS WAY TO OPEN DOORS

As the populations of elderly increase in the industrialized world, so do the number of home healthcare workers. In order to obtain access to clients' homes, workers are required to pick up and drop off keys each day – a time-consuming process that means less time spent with the care recipient.

The northern Swedish municipality of Sundsvall, with approximately 2,000 elderly receiving home healthcare, calculated that the time spent obtaining and submitting keys each year was equivalent to the work of five full-time employees. In all of Sweden, it is estimated that there are 140,000 keys that need to be signed in and out each day in conjunction with home visits.

A new solution called Teleport, which was developed by Mid Sweden Information Center

(MIC), ASSA Solid, Ericsson and Telia Mobile, replaces the need for keys with a mobile phone and a personal SMS code. Teleport has been conducted as a pilot project in one of Sundsvall's healthcare districts, where 13 persons assist 40 pensioners who need varying degrees of round-the-clock assistance. The healthcare workers each have a mobile phone with a personal PIN code for the SIM card and their own personal lock codes for each door that needs to be opened.

The code is sent as a text message from the mobile phone to an authorization server within Telia Mobile's network. Each server contains a number of parameters that approve the opening of the lock. If all codes are correct, an opening order is sent to the lock using the

Mobitex or GSM network. All visits are registered in the server as a security measure.

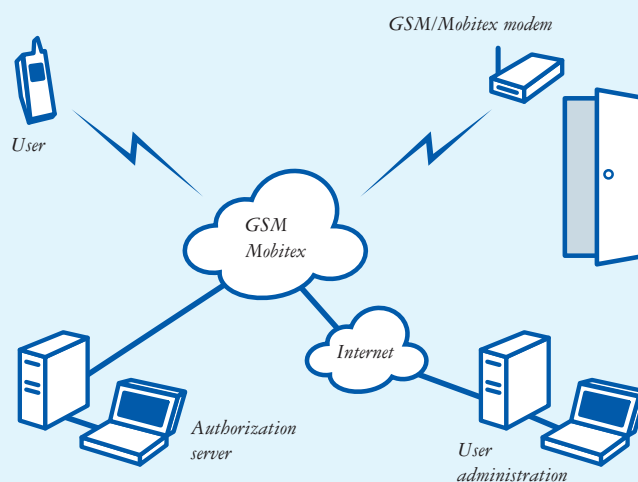
The technical equipment is installed in homes so that it will be invisible from the outside. Inside the front door, there is only one visible cable and the rest of the equipment can be hidden anywhere in the house or apartment.

Personnel who have been using Teleport say their work has become more efficient and they

have more time to spend caring for their clients.

Telia Mobile's division for mobile systems in Gothenburg emphasizes that home healthcare isn't the only type of service that can benefit from this solution. "Teleport is an ideal solution for any operation that handles keys on a regular basis, since each user can set his or her own parameters for how the system should work." ■

TELEPORT



MODEMS FOR ALL MARKETS

ClearCom (formerly Nomadic Communications) of Australia has announced two Mobitex modems for OEM applications. The NMX920 is a 900 MHz modem that is compatible with Mobitex networks in North and South America, while the NMX400 is a 400 MHz modem that is compatible with Mobitex networks in Australia, Asia and Europe.

Both modems are 2 Watt units with four-level transmit attenuation (0, -6 dB, -12 dB and -18 dB). Receiver sensitivity is

-113 dB for the NMX400 and -116 dB for the NMX920. Weighing 138 grams and measuring 89 x 68 x 22.5 mm, the NMX400 is only marginally heavier and larger than the NMX920, which weighs 70 grams and measures 100 x 55 x 12 mm. Both modems are optimized for low power consumption and prolonged battery life.

The NMX920 and the NMX400 Mobitex radio modems are compliant with the latest Mobitex Interface Specification (MIS 4A), issued by the Mobitex

Operators Association (MOA). Relevant approvals are also pending in the markets for which the modems are intended. In addition to the NMX series of Mobitex radio modems, ClearCom offers a range of development tools and solutions for wireless data communications.

Because they are low-power devices and designed for battery operation, the new modems will undoubtedly be a popular choice among device manufacturers that wish to take advantage of the new generation of interactive applica-

tions based on small, wearable or pocket-size devices. Such devices are a tremendous success in the North American market, but thus far similar devices for the frequencies used in Australia, Asia and Europe have been lacking. With the new products from ClearCom, which will be available in July, this will now change. For many Mobitex enthusiasts in other parts of the world who have been envious of the devices available in North America, it will not be a day too soon. ■

OMNI 3200M MAKES ITS MARKET DEBUT



BellSouth Wireless Data and VeriFone Inc., a division of Hewlett-Packard Company, announced last year that they would be forming a strategic alliance to develop state-of-the-art wireless point-of-sale (POS) solutions. Their collaboration would entail development of end-to-end, seamless solutions for processing wireless credit and debit card transactions over BellSouth's wireless network.

The first Mobitex-enabled terminal is now available in the form of the Omni 3200M, a wireless POS terminal with new advanced features in a sleek, compact design. The terminal has been designed from the inside out to deliver the lowest possible-cost of ownership to both financial institutions and merchants.

It features an 8 x 21 mm backlit display that enhances readability and enables value-added applications through graphics, splitscreen capabilities and menu-prompts. The intuitive menu-like interface makes the terminal's functions easy to learn and use, minimizing training costs and improving productivity and accuracy.

Further cost savings are obtained through an integrated thermal printer with a built-in paper cover that reduces jamming and thereby maintenance costs. Two telco ports eliminate the expense of a second phone line. Flash memory enables remote downloading of the latest operating systems and enhancements, which protects the merchant's investment over time.

The Omni 3200M features Soft-Pay software, a modular application that supports credit, debit, EBT and check transactions in any POS environment, while allowing for easy migration of existing software. It can also be upgraded to handle smartcard-based payments.

Using the core Mobitex technology of the BellSouth Intelligent Wireless Network, the Omni 3200M speeds up transaction times to 6-8 seconds, a drastic reduction compared with wireline transactions, which can take up to 16 seconds. As a natural extension of the popular

Omni 3200, the 3200M is geared towards businesses that want to go wireless to obtain faster transactions and higher throughput at the point of sale, while cutting costs associated with installing and maintaining business telephone lines.

Nova Information Systems, one of the top five payment processors in the US, is currently conducting a pilot project using the Omni 3200M. Users are so far very pleased with the flexibility it offers, as well as the super-short transaction times. ■

www.verifone.com



MIST LAUNCHES NBS FREEDOM II

Mist Inc., based in Nashua, New Hampshire in the US, has launched the NBS Freedom II wireless POS terminal. This is a truly mobile and debit card-ready terminal with a built in printer. Handheld and wireless, the NBS Freedom II can complete a secure transaction and print a receipt in any location.

The NBS Freedom II can communicate with the host

via a Mobitex WAN or a wireless LAN, thus eliminating the need for leased lines for communications. The new POS terminal completes transactions quickly, reliably and securely. It meets Interac security requirements for debit transactions.

The NBS Freedom II is powered by a battery pack with a built-in charger. The terminal has a backlit graphical display, making it easy to read under all lighting conditions. The built-in

thermal printer provides fast, quiet and high-quality receipts. A programmable keypad simplifies use and training.

With the NBS Freedom II, merchants have a handheld, truly portable wireless terminal that gives them the power to complete transactions wherever their customers are. This creates new opportunities to increase sales and heightens convenience for the customer. ■

PANASONIC EXPANDS TOUGHBOOK SERIES

Panasonic has been steadily advancing its position as a leading supplier of rugged PCs for mobile professionals. With the addition of the Toughbook CF-M34 to the product series, the Japanese manufacturer once again sets new standards for a compact, ruggedized and full-featured portable PC.

Measuring just 9.0" × 1.7" × 7.4" (229 × 43 × 188 mm), the CF-M34 is a

standard Windows 95/98 computer that, in addition to a full complement of ports and interfaces, features a touchscreen and an internal wireless modem. Although extremely compact, the new Toughbook has a full-size keyboard with keys large enough for touch typists. A touch pad is used as a pointing device, while the touchscreen provides an alternative input method. The screen itself is an 8.4" active matrix (TFT) color LCD with a resolu-

tion of 800 × 600 pixels and a color depth of 16 bits.

The most exciting feature of the Toughbook CF-M34 is the wireless communications options. In North America, these include Mobitex, DataTac and CDPD. GSM is supported in Europe. In all cases, the wireless modem is built in to the computer and uses a specially designed antenna that folds up from its storage position on the side of the display.

Rugged features include magnesium-alloy casing, a shock-damped hard disk, a completely sealed keyboard, a water-resistant touch pad and port and jack covers, making the CF-M34 fully vibration, shock, water and dust-resistant. Panasonic also

has full control over these components, since virtually all are made by its parent company Matsushita Electric of Japan. ■

www.panasonic.com



SIDEARM DELIVERS

MORE POWER



Melard Technologies has introduced the Sidearm all-terrain handheld PC based on the Windows CE operating system. The Sidearm is the first PC of its kind to use the 206 MHz Intel StrongARM processor, which provides fast performance without compromising power consumption. Designed specifically for wireless communications, the Sidearm supports Mobitex, DataTac, CDPD, GSM and wireless LAN modems, which are integrated in the computer.

The Sidearm is a rugged and waterproof computer that features an environmentally sealed case for use in extreme conditions and a sturdy, lightweight construction for easy portability. Thanks to the power-saving

StrongARM processor, the Sidearm offers 8 to 10 hours of operation on single charge of its Lithium-Ion battery and also provides 72-hour memory retention after the main battery becomes depleted.

Melard Technologies has been designing, manufacturing and marketing ruggedized hardware platforms, application software and related computer peripherals for the mobile workforce since 1983. The Sidearm extends a product line recognized for its outstanding durability and high performance. The new all-terrain handheld PC will be available in the third quarter this year. ■

www.melard.com

FACING GPRS



GPRS (General Packet Radio Service) is a packet-switched data service that can be added to existing GSM and TDMA cellular networks. It is an important first step in the migration to tomorrow's 3G (third-generation) mobile systems. Bengt Didner is currently product marketing manager for GPRS at Ericsson's newly formed Core Networks Mobile Systems product unit. After working with Mobitex for many years, Bengt is more aware than most of the challenges facing cellular operators as they gear up for data services, as well as the threat that GPRS might pose for Mobitex.

When will the first commercial GPRS services be rolled out?

A large number of GPRS contracts have been signed, and limited commercial operation will start from end of Q4. Full-scale deployment, however, will occur gradually as applications become available and operators expand their organizations to support various new business opportunities generated from the operation of GPRS.

Do mobile phone users really need packet data?

There are already WAP phones on the market. Cell phone users want to access the Internet. They may not realize that they are using GPRS, but cell phone users definitely need packet data. Cell phones are becoming the most common terminals used. It will become natural behavior to obtain information by using a cell phone. By using WAP-based services, it will be easier and faster to get the requested information. When local traffic information, weather reports, best-price info,

messages and so forth can easily be retrieved, it is expected that the GPRS penetration will be close to 50 percent of the GSM subscribers after 4 years of commercial operation.

Applications seem to be a key factor in launching GPRS. What is being done to drive application development?

GPRS offers end-to-end IP addressing, so there are certainly plenty of IP-based applications out there. As far as driving application development is concerned, there are two aspects to the problem. One is to find business models where operators are selling more than a data pipe. The other is adapting existing applications so that they work well over radio and can live with GPRS data speeds, which will still be slower than fixed-line access depending on the traffic load.

Ericsson is active on several fronts. We have taken the initiative in forming the GPRS Application Alliance (GAA), which is an industry consortium for promoting GPRS application development. We have also set up a

GPRS lab for testing new and existing applications. Developers have to realize that there are latency and intermittency issues to address when running over radio. What happens if the first page of a Web-based application doesn't display within the time frame you have assumed and your application logic is already on the second page?

A more general issue is that we must manage expectations. GPRS is not going to open the door to the wireless Internet or give us mobile multimedia. Both operators and developers should invest in applications that optimize customer value. Users are going to want fast, simple and useful applications. We believe that building GPRS applications on WAP makes the most sense today.

How will GPRS services be billed?

This is one of the most complex issues facing GPRS operators, but it is extremely important that they get it right and don't complicate things. Roaming subscribers do not want any surprises. When using GPRS services in another

operator's network, they will expect to incur about the same charges as they would be billed at home.

One of the new opportunities for the operators is that there will be several revenue sources, which include data volume, subscription type, use of applications and advertising. The best approach will probably be to offer subscriptions with different levels of service that make certain assumptions about airtime and volume. For ordinary consumers with a WAP phone, there will probably be a basic flat-rate service, while other users with greater data requirements will pay accordingly for the capacity and level of service that they need.

Many cellular networks are already overloaded, particularly in metropolitan areas during business hours. Will data capacity be sufficient?

What many people don't realize is that even the heaviest traffic loads in today's cellular networks still don't consume more than about 70 percent of network capacity, so there is still 30 percent remaining to be sold for data services. There is a potential trap here for operators, however. They need to find pricing models that will be sustainable even when the network needs to be expanded for data traffic.

Many people believe that GPRS will be used for casual data and that it is not suitable for mission-critical applications. Will GPRS be able to meet the reliability requirements of police and emergency services, for example?

Cellular systems, particularly those that have been enhanced with such products as Ericsson's GSM Pro and TDMA Pro, already meet many of these requirements. GPRS will be available also for these customers but may not be able to meet all the requirements of police forces, but I believe that it will be more than adequate at the next-lower level for rescue services, high-way supervision, etc.

How important is GPRS for the future success of 3G systems?

GPRS is a test bed for 3G. At least as far as infrastructure is concerned, GPRS represents a modest investment that provides a great deal of the functionality of 3G. What operators need to realize, however, is that introducing packet data is a radical change. They will need to build out their organizations and expand their business. There will be new marketing issues to

face. They will have to form new relationships with Internet service providers, as well as content and application providers. Transforming the business in this way is the real challenge and will account for the greatest expense, whether an operator is moving to GPRS today or 3G tomorrow.

Several Mobitex operators are forging alliances with cellular, paging and satellite operators and profiling themselves as suppliers of total solutions and of professional services, such as project management, training and support. Is this a viable business strategy in meeting competition from GPRS operators?

It certainly makes sense in a lot of cases, but I believe that there are many dangers inherent in such a strategy. Because they are focused on wireless data and have so many years of experience of end-to-end solutions, Mobitex operators certainly have an advantage that can be exploited. The expertise that they can bring to bear on designing, deploying and supporting wireless data applications and services is definitely marketable, and it is understandable that many Mobitex operators want to capitalize on that.

At the same time, no one can ignore the fact that there is a tremendous amount of money in cellular services and that many cellular operators have vast resources. If a new

market situation means that they need the expertise that Mobitex operators possess, there is always a risk that they will simply buy the company lock, stock and barrel.

Do you believe that Mobitex will be able to thrive alongside GPRS?

In addition to its traditional strengths in vertical markets, Mobitex certainly seems to have found its niche in two-way messaging and interactive applications. The huge success that BellSouth Wireless Data is experiencing with interactive messaging in the US certainly proves that there is a place in the market for Mobitex.

Having said that, it is equally obvious that Mobitex will only continue to thrive by concentrating on the applications and services for which it is the most cost-effective alternative and by continuing to deliver the best solutions for the customer. Because there are so many cellular subscribers, GPRS will have a very great initial impact in terms of the number of users, but it will take some time for GPRS operators to deliver the value that Mobitex operators can offer their customers today. ■



Mischievous dreams of wireless utopia

The music was building to a thundering crescendo. Lights were flashing behind me. Fireworks were exploding in front of the audience. I was taking the podium to address the Wave conference, which naturally had been named in my honor. Suddenly the cavernous auditorium was dark and silent as I opened my mouth to speak.

"Oh no!" I cried, awakening with a start. There was no time to lose now. The 6:30 a.m. wake-up call that I thought I had correctly programmed on the hotel TV system had not sounded. At the convention center, the conference attendees were already eating breakfast, and if I didn't hurry, I would miss the morning's first keynote address.

A mad rush was not my idea of the best way to start the day, but less than ten minutes later, I had showered, dressed and was putting on my lipstick as I left my room. To my surprise, I discovered that despite oversleeping by more than half an hour, I was not far behind schedule. Breakfast was still being served on the terrace outside the convention center, and the morning session was not due to start for another 25 minutes.

Perhaps it was the warm California sunshine, which was both brighter and warmer than usual for March, but I felt myself drifting off again. With a few extra minutes to spare, I took the luxury of daydreaming for a little while.

I reflected upon the previous evening at Sea World, during which we had been treated to a spectacular performance by two whales and their trainers. Swimming in unison, the whales had jumped completely out of the water, done somersaults with their trainers on their backs and even danced with the trainers. I imagined that coordination of this masterful performance had been achieved with wireless data communications.

Of course, the idea was preposterous, but it got me thinking. The previous day, we had also enjoyed music provided by one of the conference sponsors that was played entirely on wireless instruments. What if musicians on beaches and street corners all over the world could use wireless data to play in concert? If they were playing on MIDI instruments, it could even be done over Mobitex! There must be a thousand innovative uses for wireless data that nobody has thought of yet. I could just be on to something here...

The morning session was dominated by successive presentations by high-level senior executives from two software companies. The presentations were disjointed, yet thought-provoking and challenging to a point. But after listening to them both, I somehow felt I'd heard it all

before in the programmatic statements of business strategy from countless other companies. There were few real-world examples, and the speakers did not seem to know much about Mobitex. These points would be addressed by other company representatives during the course of the conference, but I nonetheless felt my mind wandering during the presentations.

I began thinking that wireless data technology could be used to coordinate the actions of corporate representatives as they traverse the globe promoting products, their company's image, or whatever it is that they do. Someone at the head office could dispatch messages to handy pocket devices with precise instructions on every conceivable presentation in the corporate information repertoire: "Show slide 15 and recite strategic objective 8a." Of course, these people would end up resembling robots, but at least they wouldn't leave out important points.

By the time the coffee break came, my imagination had got the better of me, and I admittedly became carried away by my visions of how wireless data might be used to run the world. What if vending machines worldwide could react to fluctuations in the consumer price index? When the CPI went up, the price of soft drinks, candy and other items would be adjusted upward accordingly. If prices went down, then vending machines could begin dispensing the difference as free change – at least in the poorer regions of the world. Perhaps this principle could automatically be applied to other consumer items and services, enabling us to achieve the utopian balance of supply and demand that economists claim is impossible? Well, I admit the theory needs some work, but it wasn't half-bad in my opinion.

Filled with visions of street musicians of the world uniting and vending machines dispensing free change, it left me thinking that either I was sitting on a gold mine of ideas that could make the world a better place, or that I really needed to get to bed early that night. Either way, one thing I do know is that many of history's greatest inventors didn't always have both oars in the water!

Wanda Wava

