

The 2000 GSM World Congress

*A Report on Agreements, Potential Opportunities
And Product Trends*



This Year's GSM World Congress was held in its traditional venue of Cannes, France. More than 15,000 visitors from around the world attended this year's congress, including 6,000 delegates and 9,000 attendees. A 50% increase over last year's attendance figures.

**1-4 February 2000
Cannes, France**

Attendees:

John Tengström, Product Manager
Invisix, Fort Worth: Texas, United States of America

Hide-Hito Sato, Product Manager
Invisix, Tokyo, Japan

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Introduction

The GSM World Congress traditionally takes place in Cannes, France. This year it was held between 1-4 February. This year's event brought forward market leaders from a variety of industries including handset manufacturers, operators, smart card developers, consulting firms and integrators possessing expertise in software development within a GSM infrastructure.



From the outset, this year's events were marked by overwhelming protest as to the direction the industry was taking toward WAP. During the opening hours of the congress, French students took to the streets demanding immediate action toward the delivery of WAP enabled handsets, portal content and services. Later that day a small group evaded security and made it into the trade show floor carrying banners and chanting slogans as "WAP for all – WAP for All". The group,

disguised in common everyday fashion, made certain they communicated the fact that anyone could be a WAP user. Maybe it's You?

Hidehito Sato of Invisix, Japan and John Tengström of Invisix, Fort Worth; Texas, officially represented Invisix at this year's congress. The purpose of the visit was two fold. Primarily the visit was in response to an invitation forwarded to Invisix by Finland's leading GSM carrier Sonera Oyj. This invitation was made exclusively to Invisix-Fort Worth and Invisix-Tokyo because of our expressed interest in "Sonera Mobile Pay". A comprehensive wireless payment solution currently deployed in Finland. Most notably in corporation with Hartwall, a licensed bottler of Pepsi. Essentially, Sonera's concept allows for the wireless payment of purchases placed through vending or gaming machines. Invisix approached Sonera in order to gain insight into this solution and because Invisix, Tokyo believes this solution would be a compelling proof-of-concept during their March launch.

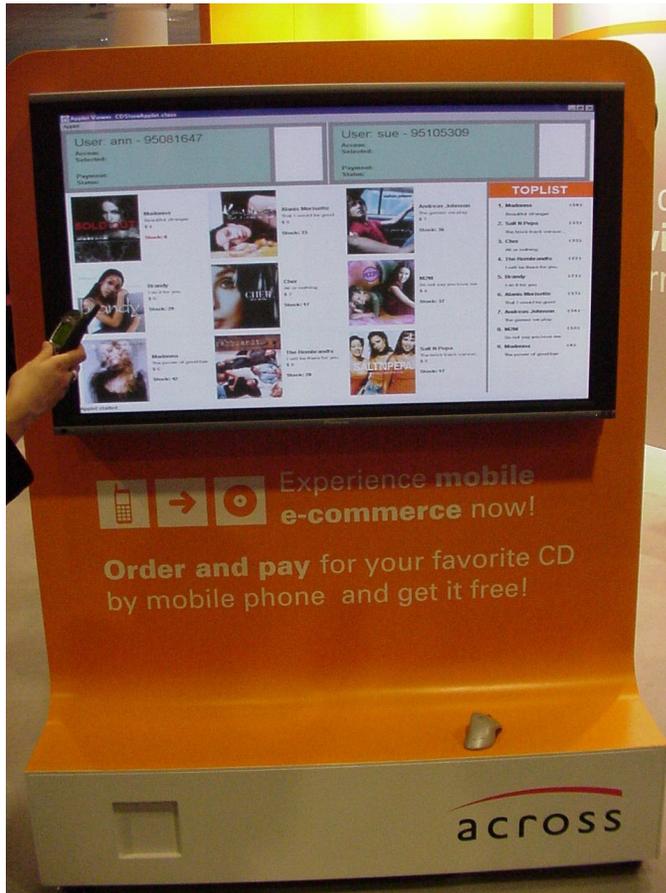
During the congress additional concepts and solutions applying to the same ideology were investigated. Two additional methods were found. One solution demonstrated by Texas instruments again incorporated Sonera software solutions, while one put forth by IBM simply utilized existing Internet protocols.

A comprehensive mission outline with defined objectives was prepared for the trip. It was devised by John Suprock and consisted of six action items. These items were then reviewed by the team and formulated into a competitive strategy through which opportunities could be recognized and identified:

- Who manufacturers the vending machine(s) and provides the retrofit for the machines being used in Sonera's solution? Can used machines be utilized? Who manufacturers the air interface? What are the hardware, software and connections required to make this solution operable?
- What are the specific handset requirements in order for this solution to work?
- Evaluate applications, especially by vendors and report activity.
- Document WAP phones, their capabilities, demos used to illustrate capabilities. Learn what is promised for release.
- Identify who is promoting applications and what they are. Who can we potentially partner with?
- Summarize what Ericsson, Nokia and Phone.com are doing as far as wireless Internet and what it is.

Detailed below is a description outlining our findings. Although many companies presented compelling arguments and expertise, it was evident that most were acting as if they were hiding something. Simply stated, when confronting vendors with direct questions about products or time to market issues, the response was "will you be at CeBIT 99"?

Across Wireless AB



Anders Hardebring
Sales Director EMEA

Mejerivagen 99
Box 47154
SE-100 74 Stockholm
Sweden

A STK application demonstrating how music CD's or tracks can be purchased via the Internet and a wireless handset.

Headquartered in Stockholm; Sweden, Across Wireless AB delivers end-to-end solutions developed in-house that are designed according to operator requirements.

Their most notable deliverables include:

- Mobile Internet Access
- Over the air Service Management
- End-to-end Security
- Secure Mobile Commerce

Of particular interest is Across's demonstration of STK/WAP based services tailored to meet specific carrier requirements within a GSM infrastructure.

In Singapore, SingTel Mobile and Fraser Securities teamed up to provide a trading solution for their clients. This involved creating a "mobile e-trading" service whereby mobile phone users can trade stocks with the assurance of end-to-end security. Investors

are able to buy, sell, cancel and even amend orders. Price and volume alerts are incorporated into the service thus enhancing its appeal.

Telenor Mobile of Norway is using Across applications delivery platform to provide its mobile subscribers with an Internet based movie and weather service.

BTCellnet intends to maintain customer loyalty by offering competitive rates, through its One Rate Service plan. Under this plan subscribers have only one flat rate across Europe to contend with. Utilizing Across Wireless's delivery platform listings of updated and preferred roaming partners can be delivered to subscribers remotely. Under this particular application the across platform is able to manage a subscribers SIM card, IMSI, phone book, and language preferences over-the-air.

In Greece parents now have the ability to update their children's short number list with six predefined numbers by simply calling a service center. Soon parents will be able to do this function over the 'Internet.

Because Ericsson maintains 25% ownership in Across, this leverage allows them to successfully land opportunities with such operators as VoiceStream, Bell South DCS and Digit. Pertaining to VoiceStream, Across has delivered a commercial over-the-air service that will enable VoiceStream to enhance its service-offering portfolio.

The e-commerce solutions they incorporate into various platforms are delivered by SETEC of Finland. They work with Solaris boxes and Oracle databases.

They are willing to discuss opportunities with Invisix. Such as OEM rights.

As proposed by Across, I will visit this company soon to review their product offering as well as discuss opportunities as to how we can make the MP3 solution a reality for our clients.

Benefon



Pictured from left to right: John Tengström, Thorsten Brysch and Hidehito Sato.

Thorsten Brysch,
Product Manager
Key Account & Export
Manager

- Benefon, a Finnish Company, was founded in 1988 by former Nokia employees.
- Three years of GSM business experience.
- Have markets in Europe, notably France and Spain.
- All manufacturing and testing is done strictly in Finland.
- In Asia, Benefon has been dealing with Singapore Telecom.

We had a very productive meeting with Mr. Brysch. Benefon was relatively open for developing business partnerships. They believe that their product line is particular to a niche market. That's why they are willing to partner with Motorola, Nokia and Ericsson.

Milestones for developing a positive business partnership between Invisix and Benefon were discussed. We agreed to the following agenda and timeline:

- By the end of April, working sample units of Benefon Esc!, will be provided to Invisix. Two units are for Fort Worth and two units for Tokyo, for Asia/Pacific, demonstrations.
- Agreement was reached that a general NDA will be prepared and signed by both parties, Invisix and Benefon, hopefully by the end of week 7. This will cover not only the Americas and Europe, but Asia/Pacific as well.
- To give exclusive system integration rights to Invisix is a sensitive matter. It requires further consideration and building upon a proven relationship.
- After review of the NDA, a visit to Benefon will be made to discuss a) NDA, b) training, c) applications d) market strategy and e) implementation of maps into Myosphere portal.
- Benefon is only interested in niche markets without competing against competitors.
- Benefon Esc!, is a GSM+GPS Personal Navigation Phone. It will be available on consumer market in the early summer (June/July) timeframe.

- End user price: approximately: Euro 1,000 ~ 1,100/unit
- Mr. Brysch, promised that he will come to visit the Invisix-Tokyo CoE within a few months.

Arbonaut is a third party, which supports the middleware required to download Internet maps onto a PC. These maps are in turn downloaded into the Benefon Esc. Currently, a Benefon Esc user can have access to three maps free of charge. When new maps are required they are downloaded over the Internet for a fee. Without going into detail, Benefon described a method in which maps that were downloaded over the Internet could not be saved or backed up for future use.

Suunto distributes the same handset under the Suunto Navicom brand name to Western European markets. Suunto played a beneficial role in the handsets development.

The Benefon Esc has the potential of being configured for other applications through simple software upgrades. The current design of the handset already has an attractive appeal for consumer markets. The uses into which it could be implemented are enormous.



Benefon Esc

Dual band 900/1800
 GSM + GPS capable
 Friend find features
 STK compliant
 T9 text input
 SMS capable



Full graphic display
 HTML/HTTP/WML Browser
 E-mail
 Clock, date, calendar, reminders,
 phonebook, tone control
 14.4 kbps circuit switched GSM data
 and fax
 SMS



Dual band 900/1800
Low end functionality
Stylish appeal

CPS – Cambridge Positioning Systems Ltd.

Andrew Pickford
62-64 Hills Road Cambridge CB2 1LA UK

CPS is a GSM-based location software, CURSOR, and hardware company for location positioning solutions in UK. It has carrier partners worldwide, including Smartone (Hong Kong), Singapore Telecom (Singapore), and Celcom (Malaysia) in Asia/Pacific and Aerial Communications (USA), Omnipoint Communications (USA), and Microcell Telecommunications (Canada) in North America, Deutsche Telekom (Germany), East Telecom (Ireland), and France Telecom (France) in Europe.

CPS and Mitsubishi Electric France released an announcement on their partnership on a mobile location system, CPS's CURSOR and Mitsubishi's CURSOR-enabled TRIUM handset on February 1.

CPS's current market focus is on GSM and no plan for CDMA now. Its system with accuracy of 60 – 70 meters compliments SnapTrack products. Andrew Pickford and Hide Sato agreed that we will review each other's activities and stay in contact for any potential project. <Hide Sato: As Qualcomm successfully bought SnapTrack, though Motorola tried, Invisix should more openly work with location based solution vendors worldwide.

Ericsson

Ericsson's booth was unique in that it was readily accessible to all attendees. The approach Ericsson took toward promoting their line of products was based on demonstrating the features of adding additional accessories such as: Chat Boards, MP3 Player, Radio, Bluetooth headset, Infrared adapter and the MC218 to existing handsets lines. The Ericsson personal were extremely friendly and went out of their way to communicate with their audience. However, products such as the Ericsson R380s or MC218 were not demonstrated as to actual functionality. Overall, their method and approach was impressive as the audience was always quite large around their booth and very inquisitive. Yet, a live demo would have sent home the message.



Ericsson Chatboard for rapid messaging and Internet interaction. Designed for use with the Ericsson model T10s dual band 900/1800.

Chat board offers:

- E-mail
- SMS
- WWW input
- Phonebook



The Ericsson T-28 series offers unique attachments as:

- MP3 Player
- Infrared adapter
- Radio receiver

During second quarter 2000 the same series will also support GSM 1900



Hidehito was compelled to give it a try!

It was even in Japanese!



Ericsson Presenter Taking John for a Dance

Coerced by some Swedish persuasion, John gave way for a dance. Could you blame him?



I'm convinced!!!!



The Ericsson R380s dual band 900/1800 uses EPOC OS, has a WAP browser and PC synchronization software. Also include are an infrared port with a built in modem.



The R380s has a touch screen with back light.

Features include address book, calendar, E-mail and SMS capabilities

Ericsson presenter's demonstrated actual MP3 audio through MP3 adapters specially designed for their T-28 series. As for any other models on display, access to a commercial GSM network was impossible, thus preventing the actual functionality of the handsets to be put to the test. I was given the contact details of people who can supply Invisix with Ericsson samples. I believe that Ericsson has a unique product offering and will pursue the contacts I was given in order to secure demo units for the CoEs worldwide.

International Business Machines



Manfred Kosmala with IBM's Cyber Pop.

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Contacts:
Thomas Fingerhuth
Manager Industry Solutions Lab
Stuttgart / Zurich

Manfred Kosmala
Events Marketing
EMEA Global Industries

Additional Contacts:

Steven Welch
IBM Research Almaden
California, U.S.A.

Industrial Solutions Labs
Hawthorn, New York, U.S.A.
Zurich, Switzerland
Yamato, Japan

IBM's Cyber Pop utilizes existing Internet technology and protocols by incorporating a cost effective solution that reduces maintenance and can be remotely programmed to transmit or receive data.

Internally, Cyber Pop consists of a motherboard, which IBM calls the "Cyberhub". The board has a 486 processor with 4 MB RAM. The OS is a stripped down version of Linux running JAVA applications. The motherboard allows connectivity to:

- Modem(s)
- Ethernet
- Serial ports

The unit has an I.P. address and a http server with firewall. Access to Cyber Pop can be made through any standard web browser or through a wireless handset with a browser or STK capabilities.

Thomas Fingerhuth, demonstrated Cyber Pop and inquired as to whether or not Invisix would be interested in temporarily presenting this solution for demonstration purposes in Fort Worth and Tokyo. It was mutually agreed that interest did indeed exist between us and that the final details or any offer to present Cyber Pop should be dealt with through further communication with attention as to how IBM wants to have this concept presented and promoted within various worldwide regions.

Thomas has put me in touch with Johan Sandell of IBM, Finland. Johan will facilitate the initial discussions we have with IBM's U.S. based management team.



Cyber Pop Presentation by Thomas Fingerhuth

LGC Wireless

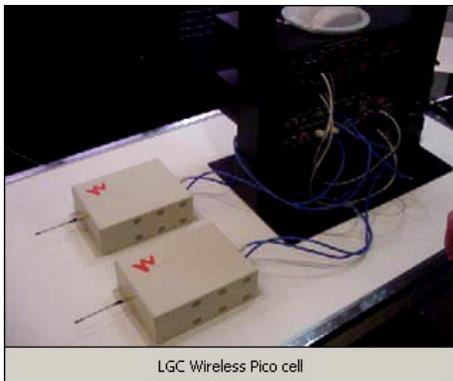


Kevin M. Geary
Director, OEM Sales
585 East Brokaw Road
San Jose, California

Pictured from left to right: Hidehito Sato, John Tengström, Unknown, Unknown, Kevin M. Geary.

LGC Wireless was approached, as they are local to our CoE in San Jose. We reviewed their solutions for delivering GSM 900, 1.8 and 1.9 within a closed environment as we are in the process of erecting a GSM network within the San Jose and Fort Worth centers.

Their solutions and pricing appear to be competitive. A dual 900 and 1.8 network with 16 pico cells was said to cost about \$50,000.00. The video below describes their in-house wireless building solution.



LGC Wireless Pico cell
Video Presentation



Microcellular Wireless Access System for
GSM 900/1.8

Because LGC Wireless also looks for OEM opportunities, we could have a possible opportunity here in relation to integrations we undertake for corporate clients.

Motorola

Bluetooth Demonstration

- Motorola was demonstrating its Bluetooth solution with taking two units of Sony VAIO Notebook PC with a video eye, two units of Bluetooth embedded Type II PC card, and Microsoft Net Meeting at the transmission speed of 1Mbps for the maximum distance of 10 meters.
- Those Motorolans who gave demonstrations were from SPS who used to work with Hide Sato when they were all in MCG in Tempe, Arizona.

They promised that they will provide Invisix few kinds of internally available Bluetooth enabled software for demonstration.



BlueTooth Demo – Streaming Video



Guy Lanrezac Demonstrating the Mix Platform and Myosphere services.

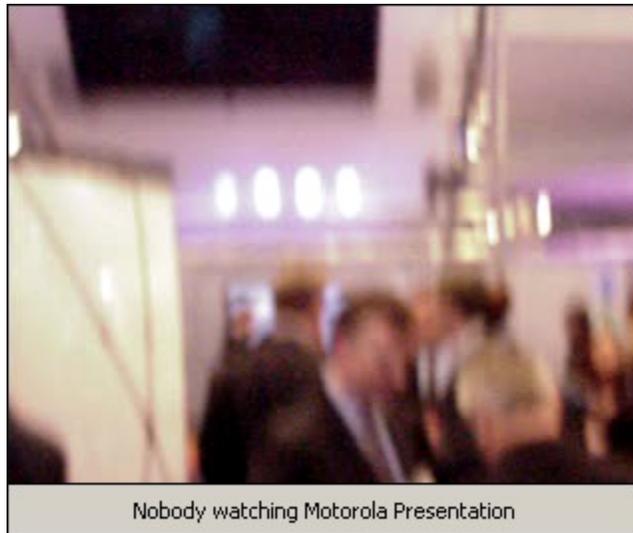
According to Guy Lanrezac, Marketing and Business Development Manager, Jim Lefebvre was given one Motorola Timeport with smart card reader to demonstrate wireless payments to the North American market. Each time prior to a demo Guy wants to be informed so that network management will perform twice as effectively. This is because all demos are via Paris, France.

This payment is method is being incorporated into Myosphere through a company know as Trintech which is providing the payment solution for the U.S. market. Additional information can be had through Marie Martinez.

An important observation I made during the congress was during a Motorola presentation. Motorola was presenting a video about our migration plans toward 3G. This video was over a large screen that was strangely angled from above. It was positioned across from Ericsson's stand.

A cocktail stand was to the left of the screen.

Although a lot of Motorolans were enthusiastic about its showing nobody was watching!



Nobody watching Motorola Presentation

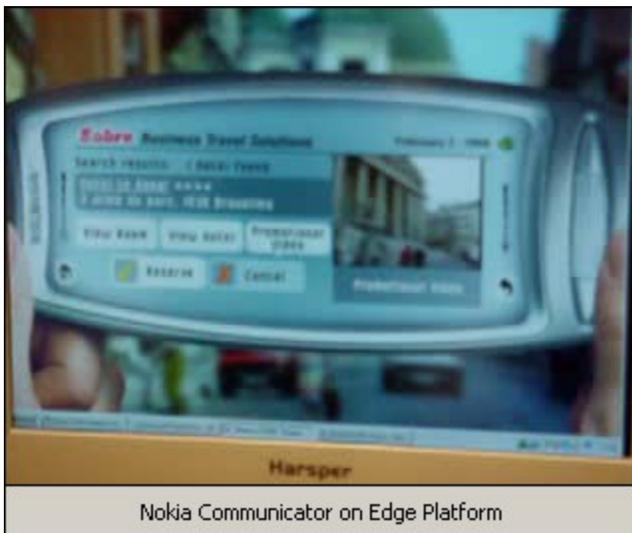
Nobody is watching!!!!

NOKIA

Everyone I talked to said that Nokia had a poor showing.

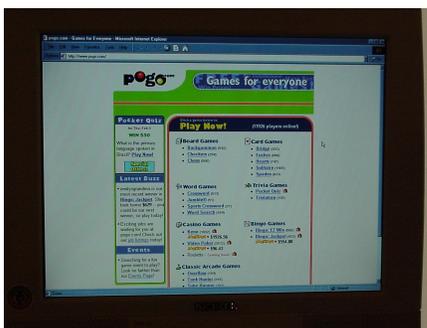
Insiders, especially Panasonic, said that although Nokia may have been the first to offer a WAP phone, the 7110 leaves a lot to be desired. Oddly enough, Nokia was presenting this product at the congress. The presenter was a non-Finnish national with below adequate communication skills (i.e. command of English).

Nokia is investing in multimedia opportunities. Pogo is one such example. This company manufactures games designed for online playing.



Nokia Multimedia Communicator emulated over the EDGE platform.

Emulated Nokia Multimedia Communicator over EDGE.



Pogo Entertainment centre.

Nokia POGO online gaming and Entertainment center for Communicator.



Nokia's only WAP enabled handset was a poor performer and highly criticized.



Nokia's wireless LAN solution.

PacketVideo



Pam York
VP of Sales & Partner Programs
Daniel Swartz
Director of Sales & Partner
Programs
Kathleen Peters
Director of Sales & Partner
Programs

10350 Science Center
Drive, San Diego, CA
92121

From front left clockwise: Daniel Swartz, Pam York, Kathleen Peters, John Tengström, Gramham Tricky, Steve Ashley and Hidehito Sato.

Had a fruitful and intensive meeting with PacketVideo.

PacketVideo is a streaming, packetized, video software company who accepted investments from Sony, Columbia Pictures, Siemens, Philips, Intel, Reuters, Rockefeller Family, and Qualcomm. This helped launch the company to the market. <Hide Sato: Invisix, or Motorola, may want to consider an investment into this company>.

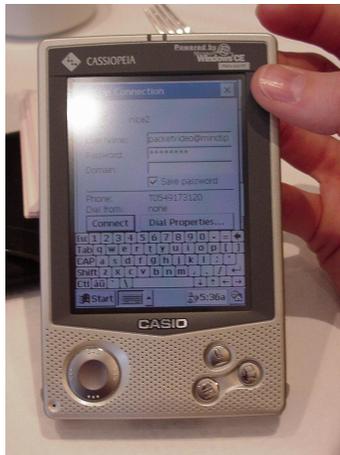
PacketVideo is hoping to establish its office in Tokyo in the near future knowing that the Japan's mobile data market has been growing extremely fast with leading the world market. It has a relationship with NTT DoCoMo in Japan for 3G trials, which was announced in January 2000, thanks to Jim Brailean's, CTO and co-founder of PacketVideo, relationship with Toshio Niki of NTT DoCoMo, currently President of NTT DoCoMo USA.

PacketVideo's product is platform independent software which can work on either CDMA, GSM, PDC, or PHS. It is committed to standards. Its main business focus is on Entertainment, Automotive, Medical and Insurance markets.

A system setup of the product for demonstration does not require much time. It can meet the Invisix Japan launch deadline in time.

We agreed upon the following:

1. Prepare and sign an NDA between Invisix and PacketVideo as soon as possible. MOU or LOI, whichever works fine with Invisix, will follow next. Then, get a statement of work ready on a project basis.
2. PacketVideo will assist Invisix in any way possible to make its Japan launch successful. PacketVideo will be able to send a letter of endorsement to Invisix Tokyo CoE.
3. PacketVideo system currently works only on Window CE or EPOC platforms. They are willing to develop partnership with Japanese PDA vendors, where Invisix Tokyo CoE can be involved in and assist them.
4. PacketVideo will give a full set of demonstration and description of its product to David Van Dyke when he visits its office to meet with Pam York on February 9.
5. Bret Crochet, Director of Sales and Business/Partnership Development in Asia, from PacketVideo will come to visit Invisix in Tokyo to meet with Hide Sato shortly.



Casio Cassiopeia prior to launch



How the connection is made.



Launching PacketVideo

Launching of PacketVideo Browser



Making the connection.



Motorola GPRS via CA-1

World's First Preview by Motorola of a live GPRS Video feed Between Cannes, France and San Diego, California.

Panasonic



Pictured from left to right, Hidehito Sato, Invisix And Hiroshi Tamano, Panasonic.

Hiroshi (Roy) Tamano, Associate Director, Sales and Marketing and General Manager, Matsushita Communication Industrial UK Ltd., Daytona Drive Colthrop, Thatcham, Berkshire RG19 4ZD

Panasonic is currently manufacturing and selling standard GSM (dual band of 900/1800MHz) handsets. The reason why they have been hesitant to start a WAP enabled GSM handset business is simply because of instability of WAP interface. “Nokia’s 7110 WAP enabled model was not stable enough!”, said Mr. Tamano. They are currently planning to announce their first WAP enabled GSM handsets at CIBIT in Hanover at the end of February 2000. It was our feeling out of the discussion with Panasonic that they will do the announcement because they have found out the way to make it stable.

The following products, including prototype ones, were displayed.

- SD Card Communicator with a video eye
- W-CDMA Visual Terminal
- Bluetooth compliant earphone set for Audio
- SD Card Voice Terminal:
 - It is a Mobile Media Distribution (MMD) service compliant handset. That product was announced by NTT DoCoMo and Panasonic in Tokyo on January 27. Air Media Inc., the joint venture of NTT DoCoMo and Panasonic with focusing on the service and product, plans to launch a MMD commercial service as early as this fall using a 64K PHS, the Japan proprietary system, data network. Mobile phone customers can download songs and concert schedules from contents providers. This handset has a slot for holding an SD memory card that can store songs over one hour.



Right: SD Card Voice Terminal with 64MB SD chip

Left: SD Card Communicator with a video eye



Closer view of CD Card Communicator (prototype).
It is equipped with a video eye and color monitor with a keyboard in compact size.



W-CDMA Visual Terminal.
This is a conceptual model for the market two years from now.



Bluetooth compliant earphone set.
It will be announced at CEBIT in late February.

Mr. Tamano mentioned that Panasonic has one big issue. They deal with three different groups of partners: contents providers, server unit/system providers, and network providers.

However, they have not been able to figure out how to come up with a total solution by bringing those three parties together. It has been a challenge for Panasonic to determine what type of contents should be provided and what kind of a browser should be selected.

Mr. Tamano was encouraged by the introduction of Invisix's business function and responsibilities that he would like to visit Invisix UK CoE shortly as the Panasonic's head office is also located in Stockley Park. We will find out an appropriate person in Invisix UK CoE to host Panasonic to find out any possible mutual business opportunities in the future.

SETEC Oyj

A Finnish SMART card manufacturer and software application developer based in Vantaa, Finland. The organization manufactures GSM SIM cards as well as a variety of smart cards used in applications ranging from chip embedded identity cards to cards that transmit data via a simple swipe over a smart card reader. Currently, Finnish citizens can obtain smart cards that are now officially used and recognized as identity documents, social security cards and as bankcards. SETEC manufactures these cards. What's more, these cards can have certain areas accessed directly by the user.

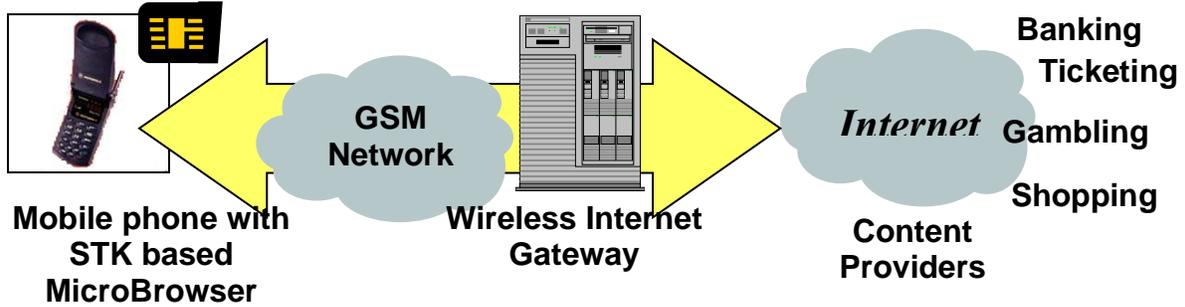


Kati Leskinen, Account Manager

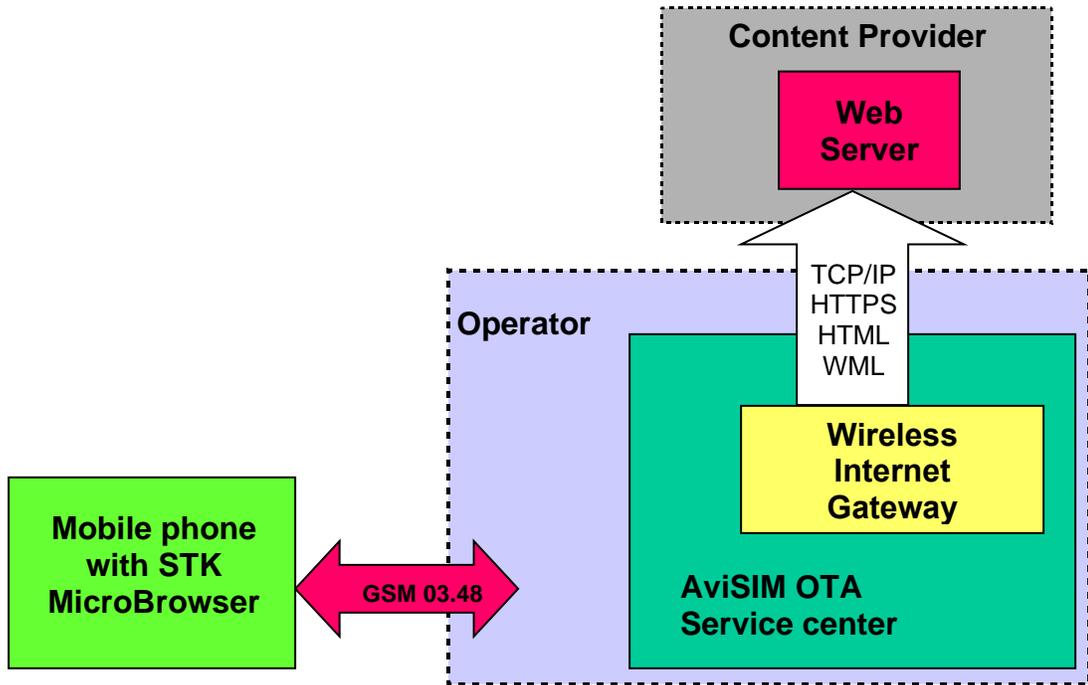
SETEC's area of expertise is indeed comprehensive. Furthermore, they have positioned themselves extremely well with other Finnish market leaders such as Sonera, Nokia, financial institutions, the U.S. Department of Defense and European governments and naturally wireless operators worldwide. They also maintain a handle on portal solutions and content as they internally develop applications that utilize STK. Through strategic alliances SETEC has formed unique partnerships that will strengthen its product offering and market position worldwide. One such alliance is with Across Wireless with whom they have jointly developed a STK micro browser. This browser and the infrastructure it operates within is extremely versatile that it in my opinion warrants further review. Especially given the recent developments with FT. What the two companies have done is they have created a STK browser which functions as if it were a WAP browser.

The comparison is so compelling that one would most likely not recognize any difference were the two technologies put side by side. Once the browser is launched menus are downloaded over the air, not as pre-programmed applets like our Office Lite solution. This means that a subscriber can access more feature-enhanced services. Furthermore, the wireless Internet Gateway they use as the bearer to translate in both directions SMS/HTTP commands is so advanced that any operators SIM will operate over its infrastructure architecture and hardware requirements (see diagrams below). The proposed Invisix solutions cannot do this as far as can be recalled. Even more compelling is that standard html pages with graphics can be optimized within hours. Making time to market indeed short. Finally, unlike what was communicated to Invisix by IPL, SETEC stated that any GSM phone with any version A.P.I. will be able to access content provided by the subscribers' operator utilizing SETEC solutions.

The Micro Browser Architecture



The Wireless Internet Gateway Architecture



As far as potential partnerships are concerned, SETEC expressed natural business instinct when I mentioned where Invisix, Fort Worth was and what we do. Here it becomes apparent how closely knit the Finnish community is and how wrong movements by any party will become quickly known. SETEC works closely with Sonera in providing the required security in various portal implementations where e-sales take place. Sonera was also present at their stand helping demonstrate access to wireless portals utilizing

Sonera's e-commerce solutions. The demos involved accessed cinema sites in Norway whereby a ticket could be purchased and a confirmation send back via SMS. Sonera owns a 9% stake in VoiceStream. SETEC was of the opinion that were we to have agreements in place with VoiceStream they could provide the micro browser and e-commerce solution needed for a company such as VoiceStream to launch with an overwhelming product and service portfolio. The product and service portfolio coming from Myosphere implementing their solutions.

It has been communicated to me through ICSD and VoiceStream representatives that VoiceStream is indeed interested in the Myosphere service. If we were to partner with Sonera and SETEC, I can envision opportunities for us in the following areas:

- 1) Myosphere as a service bureau offering
- 2) Commission on portal content
- 3) Commission on e-commerce as well as e-sales transactions
- 4) Commission on internet banking transactions
- 5) Commission on volume of deliverable traffic to operators network
- 6) Sale on implementation of infrastructure

Although I do not currently have a venue through which I can maintain familiarity and speed on new developments within GSM, I know that my understanding of the Finnish market and business culture will enable me to further enhance and enrich, the products and services we envision as a team.

Sonera

Pasi Koistinen, Project Manager,
Sonera Ltd., New Communications
Services

Reijo Rummukainen, Director of
Business Development, M-Commerce,
Sonera Ltd., Mobile Communications



Pictured from left to right: Pasi Koistinen, unknown,
Antero Norkio, John Tengstrom and Hidehito Sato.



Pictured from left to right: Reijo
Rummukainen, John Tengstrom, Hidehito
Sato and Jouni Leinonen.



Sonera mobile Pay for the gaming industry.

- Sonera raised a key question for Invisix as a system integrator, “Is Invisix going to assign technical support service and maintenance people to our products.”
- Sonera solutions are wireless communication platform independent, but specialized in GSM now.
- Sonera Smarttrust people have been working with Texas Instrument to develop a Bluetooth enabled vending machine solution.
- Any CDMA related business has not yet been determined.
- If Invisix demonstrates a Sonera’s solution at the Japan launch, it will confuse both a potential Japanese partner and customers. Any clear strategy has not yet been made for the Japan market. Sonera would like Invisix to wait until this coming summer, June the earliest, as Sonera is not ready yet.

Having spent over a year preparing for market entry into Japan launch, Sonera wants to proceed cautiously toward making further steps for developing their business in the Japanese market.

My relationship to Pasi also came out during the meeting. As it turns out he and I attended the same university, same faculty and even had a few of the same professors. Reijo on the other hand maintains personal relationships with key persons within Sonera I have dealt with in the past.

The meeting, I feel, was arranged in order to feel us out. I believe that we indeed have a potential opportunity with Sonera, but need to become mindful toward keeping our distance by allowing Sonera to contact us in due course now that they know who we are.

At the same time, Pasi said that the entire world market is something new for them because as an operator there are no studies documenting how highly competitive operators such as themselves have fared when approaching potential rivals with products and service. Thus they need to safely find their way in this new environment and build a learning curve.

Other people from Sonera, we met with during the tradeshow were listed below.

- Harri Laalo, Marketing Manager, Japan, Sonera Corporation, New Communications Services.
- Jouni Leinonen, Area business Manager, Asia/Pacific, Sonera Corporation, Smart Trust
- Antero Norkio, Product Marketing Manager, Sonera Corporation, Smart Trust

Sonera Smart Trust - BlueTooth Embedded Vending Machine



Sonera and Texas Instruments BlueTooth Vending Machine.

Sonera Smart Trust - Bluetooth Embedded Vending Machine.

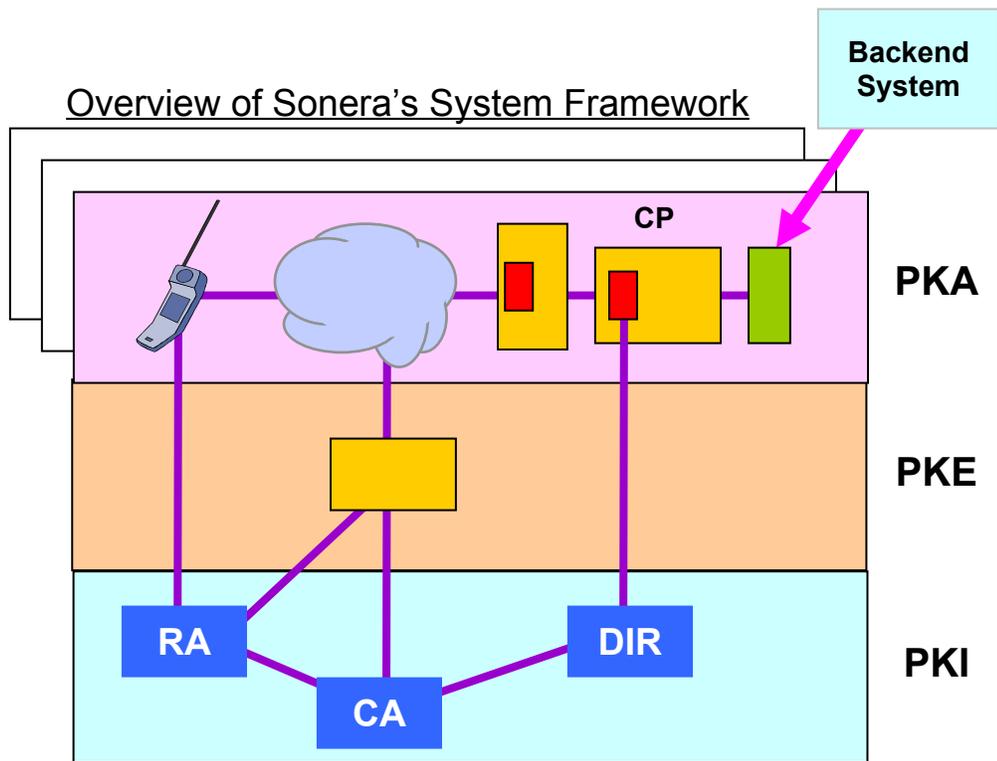
Paul Smith
Business Development Manager, Sonera Ltd.



BlueTooth Emulator

Solution Concept: a consumer buys a can of juice out of a vending machine with a Bluetooth compliant handset remotely. He/she gets an electronic certificate over the air and use it by pressing his/her pin number to get the can.

- Any electronically controlled vending machine is acceptable to implement Bluetooth compliant hardware, such as controller board, and firmware.
- Sonera chose a brand new vending machine to do the demonstration at the tradeshow.
- The air interface for the solution was developed by Digianswer.
- This brings a mobile carrier independent business model to the mobile data market. It supports transaction, authentication, security, and database management. Sonera believes that mobile carriers are still able to grow their business even under that environment thanks to a new Bluetooth technology.



- PKA : Public Key Applications
- PKE : Public Key Enhancements
- PKI : Public Key Infrastructure
- RA : Registration Authority
- CA : Certificate Authority (Sonera follows German model)
- DIR : Directory from which certificates are distributed
- CP: Content Provider

Additional Notes:

Sonera to terminate all paging services in Finland by April 2001.

Harri Vaatanen, President; Sonera U.K..

Ilkka Aura, Sonera Zed (Mobile Portal).

Sonera has 9% stake in VoiceStream.